

Ilkhanid Stucco Revetments in Iran, c. 1256-1335

Function, Meaning and Aesthetic Principles

PhD Dissertation

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Abstract

Islamic architectural revetments¹ in carved stucco medium have been one of the most obscure and understudied aspects of Islamic architecture, although there has been a recent surge in studies on the subject. Carved stuccos enjoyed a long chronological span running from the early Islamic period to the Timurid times, and were found in a broad geographical spectrum spanning from modern Spain to Central Asia. In Iran and Central Asia, the use of stucco for decorating monuments dates back to at least the Achaemenid and Parthian periods² and it continued to be important throughout the Sassanid times.³ Pre-Islamic stucco production technology and aesthetics continued into the early Islamic period, when masterpieces such as the Na'in Friday mosque (stuccos dated to c. 960),⁴ the Nuh Gunbad mosque near Balkh (8th-10th centuries),⁵ the structures of Nishapur (10th-12th centuries),⁶ the later stuccos of the Shir-i Kabir mausoleum in Mashhad-i Misriyyan (11th century)⁷ in modern Turkmenistan and the Zusan mosque stucco mihrab(s) (probably 11th-12th century)⁸ were produced.

The stucco production technology and aesthetics reached their apogee in the Seljuq (1037–1194) and Ilkhanid (1256-1335)⁹ periods, when they were produced in workshops by numerous groups of craftsmen, for religious and secular monuments. Stuccos of these two dynasties are considered to be distinct subjects and understood to have been interrupted by the Mongol invasions, but the Ilkhanid craftsmen inherited the long-standing tradition and knowledge of stucco art from their predecessors. Publications on which the understanding of the Ilkhanid stucco has been based are the monograph by Donald Newton Wilber, and works by Sheila Blair, Bernard O'Kane and Rosario Paone.¹⁰ New examinations of Ilkhanid stuccos in Iran and its neighbouring lands relating to preservation, production and decorative aesthetics, craftsmen's identities, mobility and workshop composition have also been published recently.¹¹

Ilkhanid stucco revetments have so far been studied in forms of monographs or articles dedicated to one monument or comparison of a restricted number of monuments. Research dissertations written on the subject of stucco have focused on one aspect of stuccos, such as their visual elements (iconographic studies) or geometric ornamentation. Accordingly, the bulk of Ilkhanid stucco revetments, amounting to some fifty decorative corpora, lacks systematic examination, which is the main aim of this research work. There is a need for a detailed analysis of a more extensive group of monuments, which will discuss their architectural context, the multitude of diverse aspects of stucco revetments, ranging from the technology of their production, their artistic techniques, the understanding of their craftsmanship, and for their visual features, systematic comprehension and reading of their epigraphic repertoires, discussion of craftsmen's signatures and analysis of their geometrical and vegetal elements.

¹ This work employs the term "revetments" rather than "architectural decoration," since an architectural decoration may have a multitude of functions.

² See, for example: Nagel and Douglas 2016.

³ See Azarpay 1997; Kröger 1982.

⁴ Quchani 1996.

⁵ Secco Suardo 2016.

⁶ Wilkinson 1986.

⁷ Muradov 2011.

⁸ Adle 2015, 105-110, 255-56.

⁹ For an introduction to Ilkhanid art and architecture, see Grbanovic 2016:

<https://archive.archnet.org/timelines/48/period/Ilkhanid/year/1272> (Last Accessed: December 14, 2021). For the most comprehensive information on Ilkhanid architecture, see Wilber 1955.

¹⁰ Blair 1982; 263-286; Blair 1986a 389-395; Blair 1968b; Blair 2003; Blair 2006; O'Kane 1992; Paone 1995; Grube 1981.

¹¹ Salihi and Taghavinejad 2017. See also Salihi, Taghavinejad and Rashidniya 2016; Grbanovic 2020; Salihi and Aslani 2011; Salihi and Shekofte 2014.

This provides for the possibility of assessing their aesthetic characteristics. The specific nature of stucco production and design transfer into the carved stucco medium require a systematic study. Craftsmen's signatures on this material reflect partial characteristics of identity of signatory artists, and provide information concerning their mobility for commissions. The particular frequency of stucco craftsmen's signatures on Ilkhanid stuccoworks indicates changes in their social status, and these signatures provide evidence to support hypotheses of a workshop's mobility, indirect dating, and family ties between craftsmen. Moreover, there is a need to answer art historic questions concerning Ilkhanid stuccos, and to provide information regarding the characteristics of their visual form, function and meaning within the architectural contexts and their aesthetic principles.

The main research question is: *What are the function, meaning and aesthetic principles of carved Ilkhanid stucco revetments?* The work comprises two main parts: the core of the dissertation (six chapters), which discusses the outlined aspects tied to the understanding of stucco revetments from a multitude of points of view. The second part, the appendix (the Catalogue of Monuments), comprises a detailed discussion of c. fifty Ilkhanid architectural decorative corpora in monuments which were either built or redecorated during the Ilkhanid period (1256-1335). This part of the dissertation is in fact the main source of data and information for the discussion of research questions and topics tied to the understanding of Ilkhanid stuccos, examined in the chapters of the dissertation.

The first chapter begins with a summary of history of the Ilkhanid Empire; it provides the chronological and geographical framework for the understanding of the discussed monuments and their stuccos. The chapter continues by outlining general information regarding the examined monuments and their chronological context and their relation to our understanding of the Ilkhanid Empire's history. The second chapter is dedicated to the topic of Ilkhanid architecture. It provides information regarding characteristics of Ilkhanid monuments: their function, ground plans, architectural elements and construction methods. It is a comprehensive summary of the architectural context of the stucco repertoires and enables the understanding of discussion of stuccos within their architectural context. The third chapter examines the topic of Ilkhanid monuments' patronage and especially patronage of carved stuccos. It offers information based on a more extensive bulk of some hundred and twenty Ilkhanid monuments and a further focus on fifty decorative programmes in carved stucco. It accordingly generates new information regarding the status of Ilkhanid patrons and discerned patterns of patronage tied to production and sponsorship of Ilkhanid stuccos.

The fourth chapter begins by discussing stucco production technology and artistic techniques for the manufacture of Ilkhanid stuccos. It continues by addressing the question of stucco polychromy and it provides information concerning the use of inscription styles for the design of stucco repertoires and expression of their epigraphic programmes. The most significant part of the discussion of inscriptions comprises a quantitative analysis of the Ilkhanid stucco epigraphic repertoires. We may discern patterns within the occurrence of their content and general characteristics of epigraphic programmes in carved stucco. The last part of this chapter addresses visual features of Ilkhanid stuccos, and it is arranged according to groups of stuccoworks produced by the same workshops, rather than being based on the traditional iconographic approach. The fifth chapter is dedicated to art historical phenomena tied to the understanding of the Ilkhanid stuccos. It begins with discussing the redecoration events and continues by debating the stucco craftsmen's artistic notions. It also discusses other architectural revetment media of the Ilkhanid period and the hierarchy between them. The last part of the chapter debates the question of the geographical spread of stucco artistic techniques, composition of stucco craftsmen's workshops, their signatures and mobility patterns. In doing so, it proposes a revised understanding of the concept of regional stucco schools.

Finally, chapter six provides the conclusions on the research, proposing information regarding the aesthetic characteristics of the Ilkhanid stuccos, their visual form, function and meaning within their architectural contexts. In addition the research work presents data from the monument documentation and examination (in the Catalogue of Monuments appended to the research work), such as information on monuments' patrons, architects, craftsmen, their photographic documentation and graphic elaborations, and their epigraphic repertoires.

It is hoped that the presented research work sheds some light on carved Ilkhanid stuccos and the related decorative media, and that it contributes towards a better understanding of the Ilkhanid architecture and for preservation of Ilkhanid monuments.

Introduction to the Research Work

Research Questions – Ilkhanid Carved Stucco Revetment Repertoires

This section provides information regarding the main research questions and aspects connected to the understanding of Ilkhanid monuments and their stucco repertoires. It explains why these research questions are significant and how they were arranged thematically. Lines of inquiry and significance of the proposed research are also highlighted.

Introduction

This research work proposes the first systematic research of artistic techniques and aesthetics of architectural revetments, with a specific focus on the Ilkhanid period carved stuccos in medieval Iran and neighbouring lands. It is based on data gathered during large-scale documentations of monuments. The research refers to fifty structures that were erected or re-decorated between 1256 and 1335, or slightly later. They contain interior architectural revetments, usually carved stucco, but occasionally also applied moulded and stencilled stucco, tile and wall painting media. They are considered characteristic of architectural decoration in Islamic Iran, developed mainly during the early Islamic (10-11th centuries), Seljuq (1040-1157, with later successor dynasties) and Ilkhanid (1256-1335) periods. These stucco repertoires are scattered across the regions of Iran and some of them are located in the neighbouring lands, such as Azerbaijan and Nakhchivan. Stuccos constitute above all decorative repertoires in religious structures, especially, congregational mosques, mosques, pilgrimage complexes and funerary structures (mausolea and *imamzadas*). Many field campaigns in different regions of Iran have been performed in order to document monuments, their stuccos and revetments of other decorative media, between 2014 and 2020. These stucco repertoires and their architectural context (the monuments) have been examined from multiple perspectives and their discussion is presented in the Catalogue of Monuments, the appendix to this work.

The Ilkhanid dynasty originated outside of Iran, but nonetheless adopted the art and material culture developed on the legacy of pre-Ilkhanid cultures that were long rooted in Iran and in the Islamic cultures of the Middle East. The Ilkhanids, similar to their Seljuq predecessors, were successful in forming a uniquely productive climate for the flourishing of arts, crafts and architecture. The Mongol invasion of the Iranian plateau is frequently considered a historical rupture, but the material culture of the Ilkhanid dynasty is closely interrelated to earlier periods and it was significantly shaped by indigenous traditions and political agendas of the local elites.

Studies of stucco production technology and original polychromy of these revetments retain evidence based on which it is possible to understand the regional characteristics of stucco production and types of stucco workshops' mobility. This discussion provides a further insight in decorative and redecoration campaigns of monuments. Finally, the art historical research of monuments and epigraphic programmes on their revetments indirectly provides evidence for dating of undated stuccos. Based on the research of stuccos, questions regarding function, aesthetics and meaning are discussed where relevant, and aspects of heritage conservation are addressed. References to published archaeometric analyses aid the discussion of stuccos in conjunction with epigraphic and historiographic material, and they enable the assessment of aesthetic principles of these decorative ensembles with regard to their historical context.

Conclusions on the transmission of aesthetic characteristics, production technology and artistic principles that lay behind the design and production of Ilkhanid carved stucco repertoires are

the main output of the research work. The collective of these finds ultimately allows for the understanding of stucco polychromy and aesthetics of stuccos. Moreover, the research contributes to a more comprehensive understanding of architectural decoration in medieval Iran.

Research Background

An extensive corpus of literature, photographic material and architectural drawings on relevant monuments was produced in the first seven decades of twentieth century. *The Survey of Persian Art* (1938-39) remains the most relevant publication for the study of Islamic Iranian architecture and Wilber's monograph (1955) on Ilkhanid architecture is the main point of reference for the Ilkhanid period. In these works, architectural revetments have mainly been understood as an ornamentation applied to architectural surfaces to decorate or embellish them. Despite such limitations, pioneering publications by Ernst Herzfeld (1935), André Godard (1936, 1937), Arthur Upham Pope and Phillis Ackerman (1938-39), Wilber (1955), Maxime Siroux (1971), Myron Bement Smith (1935; 1936; 1937), Dietrich Huff (1978), Ernst Grube (1981; 1989; 1994), Robert Hillenbrand (1994), Eleanor Sims (1988), Eugenio Galdieri (1969; 1972) and Paone (1980; 1981; 1995) continue to be of primary importance.

The Iranian Islamic Revolution of 1979 caused a major shift in the focus of Western research in Iranian Islamic Art and Architecture: from architectural sites to objects in Western collections. International expeditions to Iran were suspended or greatly reduced. Consequently, the pioneering publications by Herzfeld (1935), Godard (1936; 1937), Wilber (1955), Pope (1938-39) and Siroux (1971) remain the reference literature on the subject. These are supplemented with further literature on relevant monuments and their decoration by Blair (1986a; 1990; 1992; 1996) Jonathan Bloom (1993), Wolfram Kleiss (2015), Oliver Watson (1985; 2004), O'Kane (1992; 1999-2000), Yuka Kadoi (2009) and Lorenz Korn (2009; 2010; 2012), Lutfullah Hunarfar (1966), Chahryar Adle (1965; 1975; 1986; 1999; 2015), Rajaei Baghsurkhi (2009; 2013) and Kambiz Hajji Qasimi (1996-). Stucco decoration has been subject to stylistic considerations (e. g. O'Kane 1984; Shani 1989; 1996; Korn 2003), but the aesthetics of the assemblage of interior decorations of the relevant period have been addressed by only a few publications (Korn 2012; Blair 2014; Grbanovic 2017; Grbanovic 2020).

Only a limited amount of stucco revetments has been scientifically researched. Information about stucco production is limited to publications by Hans Wulff (1966) and Hesham Aslani (2014), as well as a few more recent archaeometry research papers from Iran. The Ilkhanid stucco decoration remains one of the least addressed subjects due to its scarcity in Western collections. The essential role played by archaeometry to establish compositional characteristics of architectural revetments is shown by the material from the Achaemenid period, (Nagel 2010; 2013; 2016). First studies on the polychromy of Islamic stuccos in Iran on individual monuments have proved successful (Amir Hossein Karimy and Parviz Holakooei 2014; 2015).

Research Output Significance

This research work focuses on the least studied material in Islamic architectural decoration: carved stucco, its craftsmanship, questions on its original polychrome appearance and its relation to tile decoration and wall paintings. This fills one of the major gaps within the study of Islamic Art and Architecture. It will benefit studies of thirteenth and fourteenth century Islamic stucco beyond Iran. Studying the technical properties of the materials employed for interior decoration, their designs and the relation between the different materials provides

insights into the process of designing and producing these decorative ensembles. , New insights were gained as to how designs and technical knowledge were transmitted across this period and how they impacted the final aesthetic appearance by comparing Ilkhanid stuccos with pre-Ilkhanid stuccos. This can, ultimately, contribute to an enlarged context for general studies of architectural revetments and sculptural aesthetics between Classical Antiquity and the Middle Ages.

0.1 The Main Research Question of the Dissertation

The main research question of the presented research has been formulated as: *What is the function, meaning and aesthetic principles of Ilkhanid carved stucco revetments?*

The purpose of this research is to contribute towards a better comprehension of Ilkhanid carved stuccos. Numerous questions concerning the stuccos are gathered under three main expressions: *function, meaning and aesthetic principles*. The concept of carved stuccos' *function* derives from the research premise positing that carved stucco revetments were not simply decoration or embellishment for the monuments, but that they retained specific function(s) within their architectural context.¹² This research aims to pinpoint diverse functions of carved stuccos in connection to monuments for which they were produced. The function of Ilkhanid stuccos, the role they assumed in the monuments' decorative programmes is closely tied to their *meaning*. Although the *function* of stuccos is more closely connected to their material and technical characteristics and their visual form, the *meaning* of the carved stuccos is one of their intangible aspects. In this respect, their *function* could be that of accentuating specific parts of a monument, and their *meaning* regards the message conveyed to the spectators through the content of their epigraphic programmes and aesthetic characteristics (consisting of geometric and vegetal elements). The *meaning* and *function* of stucco revetments thus reach beyond their conception as pure ornaments of art. Their *meaning* and *function* are tied to the function of monuments and indirectly to the act of patronage, which determined their production. *Aesthetics* of stuccos are understood as characteristics of their visual features which were typical of the Ilkhanid stuccos. Moreover, this aspect concerns the stucco craftsmen's notion of producing and designing the stuccos and determining their aesthetic features and their visual appearance.

0.2 Research Themes, Questions and Premises

a.) Geographical and Chronological Context of Ilkhanid Stuccos (Chapter One)

The first chapter of the dissertation examines the geographical and chronological context of Ilkhanid stucco repertoires. It is important to provide information concerning the history of the Ilkhanid Empire, its socio-political characteristics and its geographical dimensions in order to provide a framework for the understanding of the monuments and their carved stuccos. These monuments were commissioned by Ilkhanid patrons of diverse statuses who were frequently tied to the Ilkhanid state apparatus. The historical review is drawn from secondary sources. The chapter begins with a summary of the Ilkhanid Empire's history. It continues by proposing a chronological framework for classification and analysis of the monuments and their stucco repertoires. This section also discusses the relationship between the Ilkhanid monument and stucco patronage and the Empire's history.

¹² Compare to Grabar 1989.

b.) Ilkhanid Architectural Forms and Building Technology (Chapter Two)

The discussion of the Ilkhanid architectural forms and building technology in the second chapter introduces Ilkhanid architecture; it focuses on different types of monuments, knowledge of monument construction and general features of architectural elements. This chapter sets the frame for the examination of the monuments and their stuccos which are presented in the appendix, the Catalogue of Monuments, and which are discussed in the following chapters of the dissertation. This section relies on secondary literature and field documentation of Ilkhanid monuments. The main aim of this section is to provide the basic context and information for the understanding of Ilkhanid monuments in which stucco repertoires are located.

c.) Patronage of Ilkhanid Stucco Repertoires (Chapter Three)

This chapter debates aspects of patronage of the Ilkhanid stuccos and architectural structures. One of its most important aspects concerns the identity and social status of the patrons of the Ilkhanid stuccos and the pattern of monument and stucco patronage. Attention is dedicated to the nature of sponsored interventions with the main distinction being between the construction of new monuments and the redecoration, refurbishment and repair of pre-Ilkhanid monuments. The conclusions drawn from this chapter aid the discussion of function and meaning of the stuccos, which are examined in the following chapters. This analysis is based on a bulk of information concerning the patronage of stuccos which is gathered from the studies of their epigraphic programmes and gleaned from secondary sources. The sponsorship of the stuccos is also analysed in its chronological context to understand the changes between different historical periods of the Ilkhanid Empire's history.

d.) Ilkhanid Stucco Production Technology and Visual Features (Chapter Four)

This chapter concerns stucco production technology and the visual features of the stuccos. First, the stucco production technology process is examined by providing a taxonomical discussion of stucco artistic techniques, which were employed for the production of the Ilkhanid carved stuccos. This artistic technique taxonomy also aids the further study of the stucco craftsmen's mobility and it partially enables the dating of the stucco repertoires. The chapter continues by asking the question: *What were the original visual characteristics of stuccos?*. To answer this question, the polychromy traces documented on the surfaces of their reliefs are examined. Some information is gathered from the field documentation of the stuccos and further data regarding the material composition of stucco pigmentation is derived from secondary literature.

In the second part of the chapter, the discussion of stuccos is focused on their visual features consisting of epigraphic, geometric and vegetal elements. The research begins with a discussion of epigraphic repertoires from two points of view: their formal style and their content. Discussion on the most frequently occurring inscription styles on the Ilkhanid stuccos and other decorative media is provided. The research continues by examining the content of the stucco epigraphic programmes. A quantitative analysis of the gathered data (see Catalogue of Monuments) is performed in order to propose information regarding the most frequently occurring Qur'anic excerpts and content of other inscriptions on stuccos. The last section of the chapter provides information regarding the visual elements of the stuccos, according to discerned groups of related repertoires, ending in proposing remarks concerning their aesthetic characteristics.

e.) Ilkhanid Stuccos as Art Historical Phenomenon (Chapter Five)

This chapter focuses on the immaterial features of the stuccos and manners of viewing them through an art historical approach and methodology. It begins with a discussion of the redecoration interventions of the monuments, their characteristics, function and meaning. The question is then asked: *What was the craftsmen's artistic notion in producing the stuccos?* This aspect of stucco production concerns the intellectual exercise behind the stuccos and it is discussed based on material evidence gathered during the stucco documentation campaigns.

The second part explores aspects of the geographical distribution of the stuccos as well as the distribution of the artistic techniques used in their production. This is important for the discussion on the mobility of the stucco craftsmen's workshops. These aspects are equally significant for the discussion of the stucco production knowledge transfer. The last part of the chapter combines the newly acquired understanding of the geographical distribution of the stucco artistic techniques with a study of the stucco craftsmen's signatures resulting in new information regarding identity and mobility of the Ilkhanid stucco workshops. The question of regional stucco schools is debated and innovative data regarding mobility of craftsmen's workshops is proposed.

f.) Ilkhanid Stuccos: Aesthetics, Function and Meaning within Architectural Context (Chapter Six)

This chapter is the conclusive chapter and it draws together the research data from the previous chapters in order to answer the main research question of function, meaning and aesthetic principles of the Ilkhanid stucco revetments. The chapter begins by summarizing information concerning the discerned characteristics and specific aspects of aesthetic appearance of the stuccos, based on the group division of stuccoworks with shared features such as geographical location of workshops, employed visual features for the stucco composition and their overall aesthetic appearance. One section discusses the differences between the Ilkhanid and the pre-Ilkhanid stuccos and the interdependency between the stucco production technology and aspects of their visual appearance. It proposes alternative ways of debating what the style of the Ilkhanid stuccos was. Finally, the chapter addresses the question of function and meaning of stuccos, and their characteristics.

0.3 Research Methodology and Research Design – Approach to Ilkhanid Carved Stuccos and their Architectural Context

a.) Sources

Primary Sources

Field campaigns for monument research and documentation in Iran are the main source of data and information for this research work. The examination of the Ilkhanid monuments located in various regions of Iran aims at identifying material and aesthetic features of architectural revetments in carved stucco medium. A considerable number of monuments has been visited more than once, in order to perform further examinations or re-examinations of their structures and revetments. The process of studying the secondary sources on the monuments and stuccos, and their examination *in situ* enabled a database of 120 monuments to be compiled, which were either built or redecorated in the Ilkhanid period. This database was filled with the collected geolocations of monuments and data concerning various aspects of their architectural structures and stucco programmes. The database was employed in order to study the geographical

distribution of the monuments and stuccos and their diverse characteristics. Further research winnowed the number of monuments down to the most significant ones and the decision was taken to examine in detail the fifty most significant monuments with Ilkhanid stuccos in order to answer the research questions posed. Such selection was necessary due to the limits of the scope, dimensions and time constraints. These monuments and their stuccos are presented in the appendix to the dissertation, titled Catalogue of Monuments (see the Research Approach section below).

A restricted, but nevertheless significant aspect of the research is the study of tile revetments, which were among the decorative repertoires of the Ilkhanid monuments with carved stuccos. The majority of these tiles have been removed from their architectural context and are now stored in museum collections worldwide. Accordingly, the major collections holding these tiles were visited. Firstly, research of on-line databases was performed, to draw up lists of the most significant objects in storage and on display in collections. Meetings for visits to the collections were subsequently arranged. When examining the tiles, attention was paid to double-check their dimensions, research their front and rear sides and to understand better aspects of their production technology and especially their provenance. In some cases, it was possible to suggest to which monuments the tiles belonged and what their function was within their original architectural contexts. Although limited, the research of the Ilkhanid tile revetments from monuments where they formed parts of architectural programmes, together with the carved stuccos and other decorative media, enables the discussion of the context of carved stucco production and especially the decorative hierarchy between the media of Ilkhanid architectural revetments.

Secondary Sources

Two main types of secondary sources were employed to prepare this research work: archival material of historic monuments' documentation and secondary written sources.

Archival Material

Two types of material were found in archives. The most significant part consists of photographs documenting the studied monuments. These photographs were taken at different historic moments and they document the monuments prior to modern restoration interventions. The comparison of these photographs with the extant monuments helped to pinpoint restoration interventions and modern modifications of the monuments and to also monitor their decay. Comparison with, and studies of historic photographs, enabled the collection of data concerning the monuments' original appearance and constructive and decorative sequence which was later altered by modern interventions. This part of the research is significant because the majority of the restorations and archaeological interventions on the monuments are rarely consistently documented and published. In some cases, reports or correspondence concerning research of the monuments and their conservation interventions could be recovered, but this was rare.

Secondary Literature

Secondary literature in diverse languages was employed for the monument and stucco research. Apart from English language publications, works in Italian, French, Turkish, and Russian were consulted. Research by Italian scholars was significant and their publications dating from between the 1970s and 1980s stem from the international cooperation between Italy and Iran, during which several important Ilkhanid monuments were archaeologically researched and

restored. Russian language publications were employed for research of monuments in the Caucasus. Iranian scholars have been industrious in publishing an extensive number of publications, above all scientific articles on archaeometry, archaeology and art history dedicated to a restricted number of monuments. Among these, a large bulk of articles concerning Ilkhanid monuments and stucco revetments has been produced in the last two decades. These publications were studied in order to provide information concerning scholarly interpretations of stuccos and their monuments.

b.) Presentation of Studied Monuments

Monuments and their Stuccos – Field Documentation and Discussion

The selected fifty monuments, which constitute the core of the discussion in the research work, were examined in detail. The research and discussion of the monuments are presented in the Catalogue of Monuments, the appendix to the dissertation. The catalogue consists of thirty-seven entries for the monuments, but some of these are entries comprising several closely related monuments. These entries are largely descriptive, but they also contain interpretative parts. They are divided into two main parts: the first part concerns the monument and its architectural structure and the second part focuses on discussion of its carved stucco and other media architectural revetments. The entries were structured in such a way as to be comprehensive and easy to navigate and they have been subdivided into various sections, which can be consulted independently from the core of the dissertation or the entries' text. Every catalogue entry has its own number, which is employed in the core of the research work to refer to the discussion of monuments.¹³

Research finds concerning the monuments and their stuccos, presented in the catalogue, determine the understanding of stucco repertoires, relationships between them and the workshops which produced them. These finds were employed in order to organize the produced monument catalogue entries into a logical sequence. The catalogue table of contents illustrates discerned groups of related monuments. Their revetments in carved stucco are related either from the point of view of their aesthetic characteristics, or the workshop which produced them, or both. It thus becomes clear that not all monuments are grouped according to their shared geographical context, because they display diverging characteristics of their stuccos. This also reflects the findings of this research arguing against grouping the monuments and their stucco repertoires according to the concept of *regional stucco schools*.

c.) Research Design and Methodology

Research Approach to Ilkhanid Stuccos

The research and discussion of the monuments and the research findings proposed in the Catalogue of Monuments are organized according to diverse aspects and characteristics of the stuccos. Three main categories have been established accordingly, and they consist of research and discussion of different themes connected to the understanding of stuccos and their monuments.

The first level of discussion concerns research of the monuments, stuccos and other revetment media; it is of a technical nature and it draws on the earlier mentioned sources (see above). This

¹³ For further information concerning the structure of the entries, see the introduction to the Catalogue of Monuments.

examination regards aspects of craftsmanship and visual features of stuccos and corresponds to chapter four of the dissertation. It debates the technology of stucco production, questions on its craftsmanship, epigraphic programmes, polychromy and visual features of the stucco revetments. It builds the base for the art historical discussion of concepts connected to the understanding of stuccos, which form the second level of the research and correspond to the chapter five of the dissertation. These aspects comprise gathered evidence for the understanding of decorative interventions which concern production of stuccos, their relation to the other media of the Ilkhanid architectural revetments and the relationship between stucco patronage and monument function. The two performed levels of research function as the base for the discussion of the material on the third and final level, which aspires to answer the main research question of the presented work concerning function, meaning and aesthetics of Ilkhanid stuccos. This part of the research is presented in the sixth chapter; it draws together the finds of previous chapters and it provides final remarks on research finds.

d.) Research Aims, Premises and Lines of Inquiry

The presented research was performed on a number of formulated research premises concerning the carved Ilkhanid stuccos, which are summarized here.

Research Aims

The main aim of the research work is to provide an understanding of the Ilkhanid stucco revetment aesthetics. According to the core hypothesis, these architectural revetments did not have a simple function of structural ornamentation or adornment.¹⁴ Quite to the contrary, the research aims to demonstrate that carved stuccos and revetments in related architectural structures had the specific function of emphasizing the physical presence of selected architectural elements and spaces, and that they often bolstered and determined the devotional significance of architectural spaces. These characteristics of function, meaning and artistic principles of architectural revetments determined their aesthetics. The described concept of architectural revetment aesthetics encompasses decorative principles of the artists, craftsmen and designers, which constitute their artistic notion. Decorative hierarchy of the revetment media, the relation between the revetment aesthetics and their function in the given architectural context, and their patronage are essential aspects of stucco aesthetics. Although these decorative principles and hierarchy, understood here as the concept and artists' intentions, do not seem to have significantly depended on structural types, it is clear that they had a specific function, depending on architectural elements and spaces they were produced for and on their iconographic content.

The research aims to comprehend principles¹⁵ which were employed for the design and production of the architectural decoration; they go along with an aesthetic perception and with a logic of meaning that was allotted to certain architectural elements, surfaces and spaces. In this context, *meaning* is understood as the specific idea which the architectural revetment conveys to the spectator interacting with the structure. In brief, the three aspects of function, meaning and aesthetics are closely interconnected, as demonstrated in this research. New hypotheses regarding Ilkhanid stucco revetments can thus only be suggested if these three aspects are addressed jointly. This research explores these hypotheses by inquiring about the

¹⁴ See the seminal work and discussion of visual features of Islamic art and architecture by Grabar. Grabar 1989.

¹⁵ Principles or employed logic.

relation between the revetment media, their epigraphic and ornamental vocabulary and the relation of the stuccos to their location and position within the architectural spaces.

Ilkhanid Stucco Research Design – Practical Framework

The main medium of Ilkhanid architectural revetments are carved stuccos. Where relevant, other decorative media, such as tiles, applied moulded and stencilled stuccos and wall paintings are addressed. The main focus of the research however consists of the studies of stuccos and their craftsmanship, epigraphic programmes, ornamental vocabulary and colour. Stucco craftsmanship's artistic techniques are researched based on field documentation and art historical research, and published archaeometric data. Polychrome stucco is discussed building on information extrapolated from archaeometric analyses of stucco pigmentation traces. The discussion of polychrome stucco leads to a better understanding of the original appearance of stuccos, artists' colouring notions and aesthetics. The acquired understanding of stucco craftsmanship and colour is combined with a discussion of stucco ornamentation and epigraphic programmes. The research of stucco revetment inscriptions (historic and religious) provides information on patrons, artists and significant personages involved in patronage of stucco repertoires. This methodology has so far been adopted only for a handful of monuments in Iran and numerous monuments remain unaddressed. Unlike the stuccos and wall paintings, scholarly research on the Ilkhanid tiles relies heavily on revetments stored in the Western museum collections. It disregards the importance of the architectural context for which the tiles were produced and in which they originally bore a specific function and meaning. This perception of the Ilkhanid tiles requires a re-examination.

Lines of Inquiry

Ilkhanid Stucco Research

The research asks: *What were the stucco artistic techniques, craftsmen's workshops and stucco decorative principles and aesthetics?* Field observations of the stucco revetments and comparative studies of stucco inscriptions and decorative imagery serve to study stucco production, organization of stucco workshops and regional characteristics of revetments. Information about artists and craftsmen involved in the stucco workshops, especially the role of calligraphers, is researched via epigraphic studies. Research in archaeometric publications and documentation of pigmentation traces on stuccos aids the understanding of polychrome stucco, its colouring principles, its relation to tile revetments and its function within architectural revetment aesthetics. The research premise suggests that the stucco polychromy determined its visibility and boosted its plasticity. The juxtaposition of stucco and tiles highlighted the key interior space(s). Research of these preliminary hypotheses provides further insight into the significance of the decorative hierarchy between stuccos, tiles and wall paintings. A better understanding of stucco polychromy is essential also for the studies of monuments where the original pigmentation has been altered.

Ilkhanid Stucco Craftsmanship

Current understanding of stucco craftsmanship still depends on Wulff's publication from 1966, which is based on Wulff's observations of contemporary craftsmen. Some information is also provided by Aslani's 2014 monograph. Only limited archaeometric research has been conducted on the Ilkhanid stucco pigments, and the research of stucco composition and the presence of (in)organic materials in stucco for these two periods remains entirely unaddressed.

The theme of stucco production necessitates a detailed revision based on archaeometric analyses of stuccos and on studies of revetments *in situ*. Studies of published archaeometric research contribute towards the discussion of the composition of stucco craftsmen's workshops, and the role of their members within them. The question of stucco craftsmen's mobility is addressed in order to revise the existing scholarship on the subject.

Ilkhanid Polychrome Stucco

So far, a seldom discussed aspect of stuccos is their original polychrome surface. Research of published archaeometric analyses of stucco pigmentation traces provide information about the type of pigments used by the Ilkhanid craftsmen. Exemplary research of Seljuq stucco pigmentation by Holakooei and Karimy proves that archaeometric technical analyses of stucco revetment pigmentation can provide invaluable information on the mineralogical composition of the pigments.¹⁶ But these studies are limited to purely archaeometric and technical observations about the material composition of stucco revetment pigmentation and do not aim to address the question of the original polychrome appearance of the stuccos or artists' stucco colouring notions, which determined their aesthetics. This research fills this gap by employing the published archaeometric data for art historical discussion of the Ilkhanid stuccos. The question of the original polychrome stucco and the stucco aesthetics can accordingly be better understood. This aspect of research is connected to the relation between stuccos and other revetment media in the same architectural interiors and occasionally also on their exterior surfaces.

Ilkhanid Stucco Patronage

The theme of stucco patronage is of importance for a deeper understanding of the Ilkhanid monuments, especially for the comprehension of the context in which they were built and their meaning and function. Extant information regarding stucco patronage requires re-examination and further investigation. Studies of written sources, epigraphic programmes' research and quantitative work on the gathered data enable a revised understating of the Ilkhanid patterns of monument patronage, which comprise carved stucco decorative programmes. The understanding of patronage aspects of this material culture enables the discussion of possible links between state policies, socio-political climate and the role of monument construction and revetment patronage.

Ilkhanid Redecorations of Monuments' Research

Frequent Ilkhanid architectural revetment redecorations on the Ilkhanid or pre-Ilkhanid monuments were likely performed according to clearly defined aesthetic principles and they were often determined by patrons' political motivations. Developing this hypothesis gives a better insight into characteristics of the Ilkhanid redecoration interventions. New knowledge about architectural revetment aesthetics explains the relation between monumental and minor, and between secular and religious decorative undertakings. The research premise sustains that the purported Mongol decorative exuberance stems from the scholarly lack of comprehension of the monuments' decorative chronologies which often comprised several decorative interventions. The Ilkhanid decorative principles seem to be closer to Seljuq aesthetics than the traditional arguments of Pope, Grube, Hillenbrand, O'Kane and Raya Shani might imply. The

¹⁶ See, for example, Holakooei and Karimy 2015.

research outcomes are employed to redefine the Ilkhanid decorative aesthetics and reassess the impact of the Mongol invasion on the (dis)continuity of Iranian decorative aesthetics.

Chapter One: Some Remarks Regarding the History of the Ilkhanid Empire and its Architecture

Figs. 1-4.

*1.1 The Ilkhanid Empire and its Material Culture**Introduction*

This section provides some general remarks regarding the context of the Ilkhanid material culture. It sets the background for the understanding of the Ilkhanid carved stuccos and their monuments. The section provides new information concerning the frequency and extent of the Ilkhanid building activities and stucco production in a chronological context. In doing so, the section indicates that the Ilkhanid building activities took place during the entire Ilkhanid period and without a substantial break which could have been caused by the Mongol invasions of the Iranian territory. The research provides this information based on the gathered geographical locations of the monuments, which were either built or decorated in the Ilkhanid period. Another important contribution of these research findings indicates that the building activities and production of stuccos did not cease in the time following Abu Sa'id's death and the dissolution of the Empire. Quite to the contrary, Ilkhanid aesthetics and building as well as decorative technology continued to be employed by builders and craftsmen for a few more decades.

Background

The Ilkhanid Empire encompassed the following geographical units: Anatolia, Armenia, Azerbaijan, Georgia, Iran (comprising Jibal, Fars and Kirman), Iraq and historic Khurasan. It was created following the division of the Great Mongol Empire, upon the death of its founder, Genghis Khan (r. 1206-1227). The first Ilkhanid ruler, Hülagü, the grandson of Genghis Khan, determined the external borders of the Empire through military campaigns. The landmark conquest of Baghdad in 1258 signified not only the disintegration of the most important political unit, the 'Abbasid Caliphate, but also the consolidation of the Ilkhanid Empire, and the process by which knowledge started shifting from the former 'Abbasid capital eastwards, towards Iran. Cultural and artistic influence from Baghdad is reflected in Ilkhanid book art and architectural revetment design and production. The centre of the Empire, the Iranian territory, experienced an era of cultural, political, and economic renaissance during the Ilkhanid rule. Common perception of brutality and destructiveness of the Mongol conquest, however, too frequently overshadows the cultural renaissance that Iran and its neighbouring lands experienced under the Ilkhanids.¹⁷

The accepted perception of the Ilkhanids as an essentially nomadic society, unable to appreciate arts, architecture, and science, is erroneous. A reappraisal of these statements regarding the Mongol and Ilkhanid history began recently, but Ilkhanid material culture, especially architecture, still requires a thorough reassessment. The Ilkhanid imperial structures, such as the mausoleum of Uljaytu in Sultaniyya (UNESCO World Cultural Heritage Site; 1305-1316/20; Cat. No. 27) and Abaqa Khan's summer palace of Takht-i Sulayman (UNESCO World Cultural Heritage Site; 1270s), were recognised as monuments of exceptional importance during the early surveys of Iranian architecture by Pope and Godard. However, the majority of the remaining Ilkhanid monuments were rarely addressed in scholarly works.

¹⁷ Such perception is well reflected in the volume five of the Cambridge History of Iran. Boyle 1968.

Ilkhanid fine arts and crafts have been incomparably more appreciated, because many objects of Ilkhanid art found their way into major Western collections (the Metropolitan Museum of Art, New York, the British Museum, the Victoria and Albert Museum, the Louvre, the Berlin Museum of Islamic Art and the Hermitage Museum). One of the major issues regarding the appreciation of Ilkhanid architecture is the dispersal of the majority of Ilkhanid tiles across countless Western collections, while the rest of the stuccos and wall paintings remain *in situ*. Iran was ruled by some of the world's superpowers throughout its history, which left behind an enormous architectural and artistic legacy. This is further reflected in the fact that Iran today has twenty-four UNESCO World Heritage Sites and it ranks as the eleventh country in the world by concentration of UNESCO Heritage Sites.¹⁸ It is thus understandable that, in this context, minor Ilkhanid structures and other monuments were afforded less attention. They are nonetheless important as exponents of the aesthetic and artistic culture of the Ilkhanid Empire and should be thus considered part of Iran's cultural heritage.

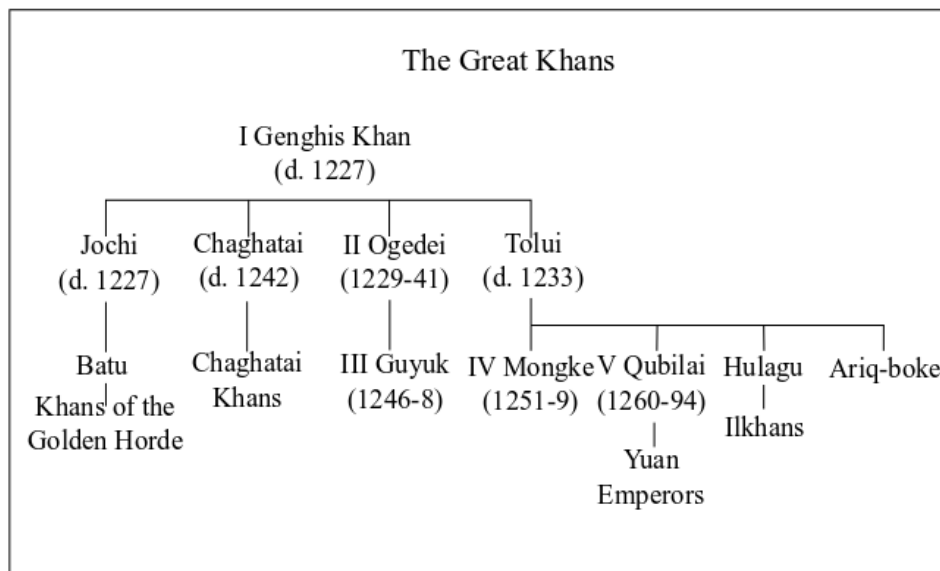


Figure 1: Schematic representation of Mongol Empire's Great Khans dynasty.

The Golden Age of the Ilkhanid Architectural Patronage

The majority of monuments discussed in this research work was constructed during the Golden Age¹⁹ of the Ilkhanid Architectural patronage; when the Empire was ruled by Ghazan Khan (r. 1295-1304) and Sultan Uljaytu (r. 1304-1316), but other monuments are also studied. In this period, Ilkhanid artistic and architectural production reached its zenith, due to the favourable economic and administrative conditions within the Empire.²⁰ Ghazan Khan organized his Empire and assured its prosperity with numerous reforms described by vizier Rashid al-Din in *Jami al-Tawarikh* (The Great History). The *Pax Mongolica* enabled a continuation of culture, material, and knowledge exchange along the Silk Routes. This climate reflected not only in Ilkhanid material culture, but also in the characteristics of the Empire. The reigns of Ghazan Khan and Uljaytu were marked by religious eclecticism: Ghazan converted to Sunni Islam and

¹⁸ <https://whc.unesco.org/en/statesparties/ir> (Last Accessed: November 22, 2021).

¹⁹ The term "Golden Age" is proposed by scholars, to denote the period in Ilkhanid Empire's history when most of the monuments were constructed.

²⁰ See, for example: Brambilla 2012.

Uljaytu oscillated between Christianity, Buddhism, and Sunni and Shi'i Islam. Ilkhanid architectural patronage mainly depended on the religious initiatives of its rulers and their religious creeds, via the Ilkhanid officials; this is frequently directly reflected in the religious contents of monuments' epigraphic programmes. Ghazan ordered the construction of Islamic religious sites and the formation of pilgrimage centres in order to enable additional economic growth through pilgrimage, and to ease the control over the Empire's population. In sum, this particular historic period determined the massive and extensive campaigns for construction or redecoration of monuments across the Ilkhanid Empire, including the monuments discussed in this research.

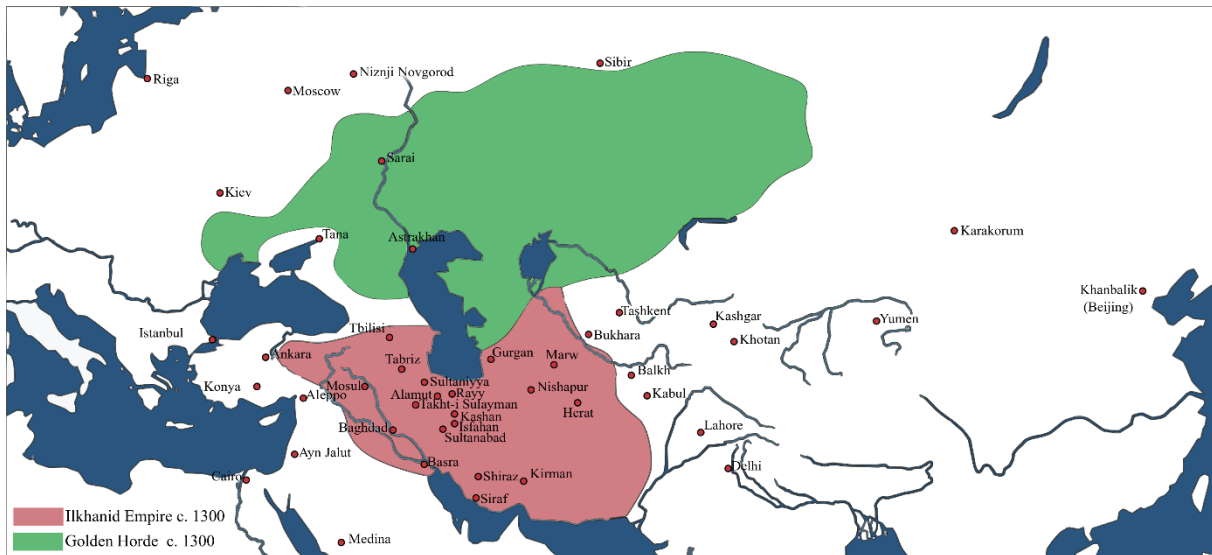


Figure 2: Map showing the extent of the Ilkhanid Empire and the Empire of the Golden Horde, around 1300.

The Cultural Exchange of the Silk Routes as told by Ilkhanid Architecture

Three main factors determined the characteristics of Ilkhanid architecture and architectural revetments: the pre-Ilkhanid Iranian tradition of architectural elements, forms, and revetment production techniques, the Ilkhanid religious eclecticism, and architectural revetment design and the ornamental vocabulary originating from other artistic centres along the Silk Routes.²¹ This research demonstrates that only a brief interruption in artistic and architectural production occurred in the lands conquered by the Mongols. This above all applies to Ilkhanid architecture, where architectural forms and elements derive from previous Seljuq, early Islamic and pre-Islamic architectural practices in the Iranian territory. The architectural decoration of several Ilkhanid monuments explicitly displays Shi'ite and Sunni inscriptions; the religious content of these inscriptions was dictated by imperial decrees regarding the official creed. The ornamental vocabulary of Ilkhanid architectural revetments is perhaps the best visible transcultural element of Ilkhanid architecture. This topic has been much debated and remains unresolved.²² It is currently possible to suggest that not all foreign (to Iran) ornamental vocabulary arrived from the Far East. Calligraphic and artistic ateliers, artists and craftsmen who migrated from Baghdad to the centre of the Empire (Iran), also acted as transmitters of Far Eastern and Near Eastern designs and ornamental vocabulary. Chinese elements are nevertheless the most evident transcultural elements in Ilkhanid architectural revetments, above all in the ceramic medium.

²¹ See Grbanovic 2017b.

²² For literature concerning the matter, see Grbanovic 2017b.

The most common are floral motifs (peonies and lotuses), landscape motifs (clouds and mountains), and apotropaic mystic beasts (phoenixes and dragons). These motifs are widespread in Ilkhanid book art, textiles and metal works. These aspects are reflected in Ilkhanid architectural revetments via four main artistic media: tiles, carved stuccos, applied moulded and stencilled stuccos and wall paintings. Their transcultural characteristics are also manifested in their shared artistic technology. These revetments were originally polychrome; similar pigments were perhaps used for their colouration, as those employed by artists for colouration of the Buddhist caves of Western China, Samanid stuccos at Nishapur (north-eastern Iran), Seljuq stuccos in central Iran (Abarquh) and pre-Seljuq wall paintings in the Isfahan Friday mosque.

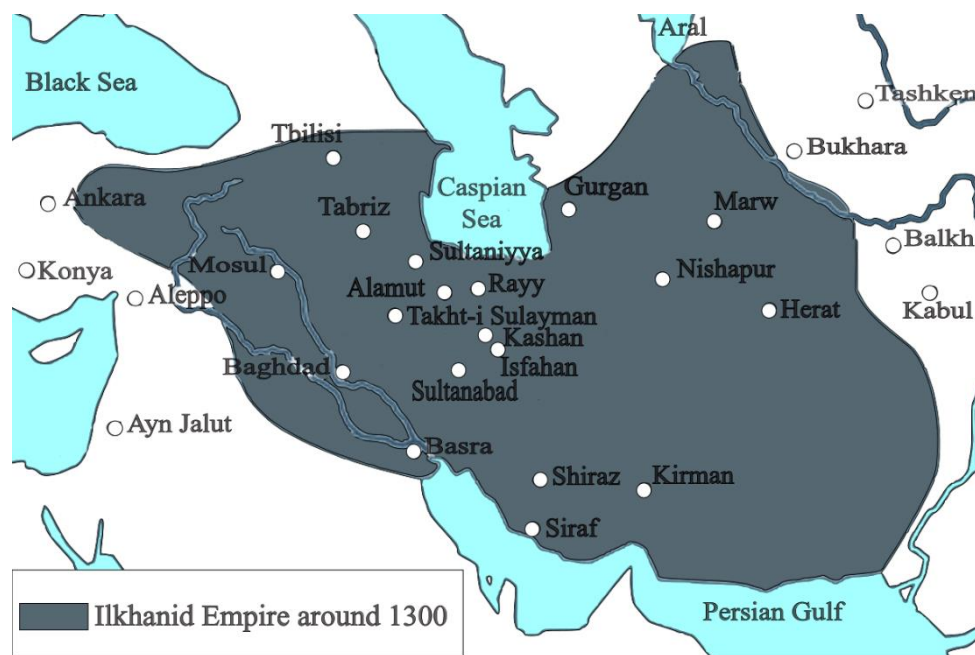


Figure 3: Map showing the territory of the Ilkhanid Empire around 1300.

Ilkhanid Architecture and Stuccos: Characteristics and Research Issues

The Ilkhanid architectural legacy comprises some one hundred and twenty monuments.²³ The most important secular structures are the summer palace (Takht-i Sulayman), caravanserais and urban commercial halls (for example: Khan al-Mirjan, 1358, near Baghdad). Ilkhanid religious structures are categorized according to their function: mosques, madrasas (religious schools), *khanqahs* (complexes for the housing of the Sufi orders), mausoleums and tomb towers. Frequently occurring architectural structures in Ilkhanid architecture are Sufi shrines (or mausoleums) and *imamzadas* (tombs for descendants of the Twelve Imams). The Ilkhanid dynasty's main contribution to Islamic architecture is the development of these architectural forms and the creation of a new syntax between architectural forms and elements, and rich architectural revetments in carved stucco, applied moulded and stencilled stuccos, tiles and wall paintings.

Ilkhanid architecture is commonly perceived by scholars as unprecedentedly monumental.²⁴ This misinterpretation is caused by the fact that only a handful of Ilkhanid structures have been

²³ For bibliography on the subject, see Grbanovic 2016 <https://archive.archnet.org/timelines/48/period/Ilkhanid/year/1272> (Last Accessed: December 14, 2021).

²⁴ See, for example, Brambilla 2012.

researched. The most well-known Ilkhanid monuments are those of more monumental dimensions; and often imperial commissions, located in larger settlements: the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), the Rabi-i Rashidi (c. 1300) near Tabriz, the summer palace of Takht-i Sulayman, the Varamin Friday mosque (1322; Cat. No. 28), the complex of Bayazid Bistami (1120; 1300-13; Cat. No. 19), the Turbat-i Jam complex (1236; 1320-33; 1362-63; 1440-41; 1443; Cat. No. 30), the 'Abd al-Samad complex at Natanz (1120; 1300-13; Cat. No. 12), the Uljaytu mihrab (1310, Cat. No. 1) in the Isfahan Friday mosque, the mausoleum of Pir-i Bakran at Linjan (1298-13; Cat. No. 2) and late Ilkhanid mausolea in Yazd (Cat. No. 29).

In addition to the listed monuments, further smaller Ilkhanid monuments were constructed during the Ilkhanid period. These structures might be indicators of prosperity in the areas where they were built.²⁵ For example, the most important Ilkhanid structures constructed or re-decorated in the Isfahan area are Friday mosques of Haftshuya (Seljuq and Ilkhanid; dated c. 1300; Cat. No. 3), Farfan (c. 1320s; Cat. No. 5), Gar (c. 1300; Cat. No. 7), Dashti (1325) and Ushturjan (1315-16 rebuilding and redecoration; Cat. No. 4), and shrines or mausoleums of Pir-i Bakran and Garladan - the *iwan* of Sayyid Muhammad (early fourteenth century). Construction of these religious structures might indicate developments of the Isfahan area during the Ilkhanid period.²⁶ This becomes evident when the geographical locations of these structures are observed and juxtaposed to the earlier Seljuq structures; the Friday mosque of Barsiyan (1105; 1134), the minaret of Ziyar, and structures in Rahravan, Azadan, Gaz, Sin, Kaj, and Iziran.

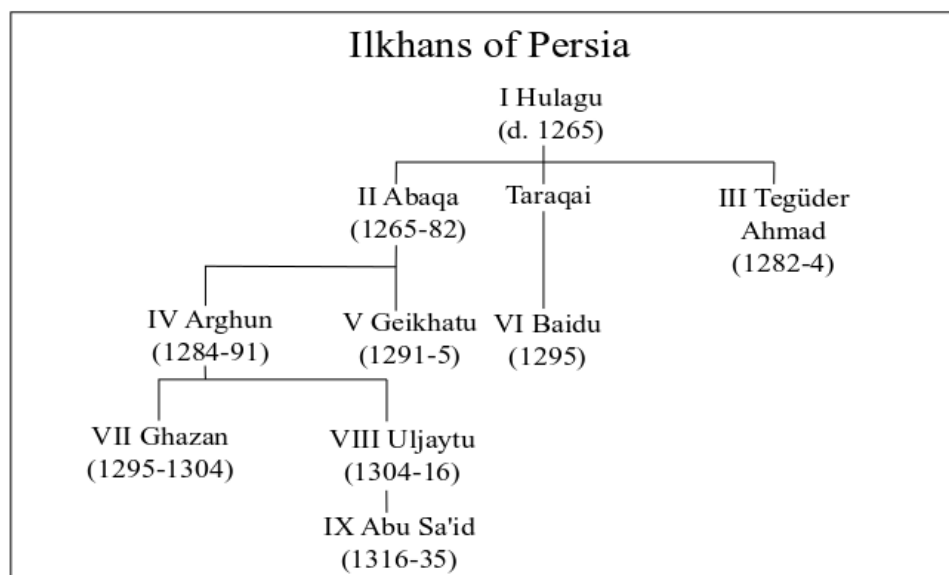


Figure 4: The House of Hulagu – the dynasty of the Ilkhanid rulers.

²⁵ As suggested by Paone. See Paone 1981.

²⁶ See Paone 1981.

Preservation of Ilkhanid Monuments

To understand the history of Ilkhanid architecture it is essential to also comprehend the history of research and conservation interventions for the preservation of these monuments. This is essential for the understanding of bibliography on the subject, for the comprehension of historic photographs of monuments and their alterations through the passing of time. Accordingly, a brief account concerning the history of interventions and research of Ilkhanid monuments is provided here.²⁷

The First Preservation Interventions (1920s-1950s)

Published or archival photographs, which document the state of preservation of monuments through time and past archeologic or restoration campaigns, are the main source of information regarding monuments' alterations, because most restoration interventions have been scarcely documented. The lack of digitalization and issues of access to material dispersed in numerous archives (e. g. Iran, Italy, the UK, and the USA) render the research challenging. The most important publications of this material are: Pope's *Survey of Persian Art* (1938-39), Wilber's monograph on Ilkhanid Architecture (1955), Siroux's publication on caravanserais in the Isfahan province (1976), scientific articles by the Italian mission to Iran (1970s-80s), and the publications of Iranian scholars, especially those by Hunarfar (1965) and Naraqi (1969). The majority of these publications were produced prior to the availability of colour or digital cameras and they thus do not document the original colour of the Ilkhanid architectural revetments, which is one of the most important aspects of Ilkhanid architectural revetment aesthetics. The most significant archives of Ilkhanid architecture in Isfahan and its surrounding areas are Donald Wilber's archive (Michigan), Robert Byron's archive (London), the IsMEO (Istituto Italiano per il Medio ed Estremo Oriente) archive (Rome/Naples), the Eugenio Galdieri archive (Rome), and the archives of the Iranian Cultural Heritage Institution (Teheran, Isfahan). Despite all these difficulties, it is nonetheless possible to reconstruct the characteristics of early conservation interventions on some Ilkhanid monuments. These restoration and preservation interventions date back to the time of international cooperation for the preservation of cultural heritage between Iran and France (1928-1960s) and between Iran and the USA (1930s). In this historic period, Iranian monuments were documented and first conservation interventions aimed at their preservation were performed.²⁸

The state of preservation of Ilkhanid monuments can be roughly divided into two groups: monuments which were used for religious practices, from their construction until the present day, and monuments which, at a certain point in history, became disused and thus fell into a state of decay and disrepair. Monuments that were used continuously throughout history were subject to subsequent alterations related to their religious function, sometimes up to the degree that little was left of the original structure. This complicates the researcher's ability to assess the monument and determine future interventions. The architectural historian's task is also challenging. It is often difficult to date parts of the structures and their revetments. In the case of disused buildings, the situation depends on the level of their decay. Some monuments remained almost intact up to the present day and escaped modern alterations. This is, for example, partially the case for the Uljaytu mausoleum in Sultaniyya (Cat. No. 27) and a good example is provided by the Pir-i Bakran mausoleum in Linjan (Cat. No. 2). It is, however, often difficult to determine the historical period in which a certain structure became disused. The

²⁷ Compare to Grbanovic 2017b.

²⁸ See Grbanovic 2017b.

Uljaytu mausoleum in Sultaniyya is one of the imperial and perhaps the most monumental Ilkhanid structures. Consequently, it has been featured in the majority of the most important historic travelogues, such as writings by Adam Olearius,²⁹ which provide important information concerning the monument's state of preservation and its appearance. This is, however, not the case in Linjan, where it remains unclear when the mausoleum fell into disrepair. In such cases, only an assessment of photographic documentation of the mausoleum's pre-restoration state can provide an approximate indication of the structure's decay. In other less fortunate cases, where structures were disused at an early stage and quickly fell into decay, only fragments of the structures and their architectural revetments remain. Depending on the state of decay of the monuments, and building upon the available resources, decisions were taken for restoration campaigns.³⁰

The First Scientific Preservation Interventions (1960s-1970s)

The second phase of restoration campaigns was determined by the activities of the joint Italian (IsMEO) and Iranian mission in the Isfahan province and north-western Iran. Italo-Iranian teams worked side by side between the 1960s and the 1970s to safeguard Iranian architectural heritage in Isfahan and Sultaniyya.³¹ Mutual scholarly exchange and capacity building activities were part of this international cooperation. These restoration interventions were mostly preceded by archaeological excavations of monuments, scientific research, and documentation of architectural structures. This, combined with the fact that the majority of monuments had already undergone limited urgent repairs to their main structural parts during earlier campaigns, allowed restorers to focus on other aspects of architectural heritage preservation. Research teams could accordingly dedicate their attention to the research and preservation of Ilkhanid architectural revetments. The main flaw of these interventions is that they left behind only a handful of published reports informing about their exact characteristics. The Uljaytu mihrab (Cat. No. 1) and the Pir-i Bakran mausoleum (Cat. No.2) were researched and restored at this point.³² The first preliminary information regarding Ilkhanid polychrome stucco aesthetics accordingly derives from these interventions, which also consisted of the cleaning and the consolidation of stuccos, including pigmentation traces and gilding. Time has shown that these interventions assured the stucco revetments' preservation up until the present times. These undertakings are of great significance, because through scientific exchange, collaboration, and capacity building, new restoration techniques and theories that were developed in Italy made their way to Iran and partially determined the development of Iranian cultural heritage preservation methods and approaches.

Iranian Preservation Interventions (1980s-present)

The documentation of preservation interventions on the Ilkhanid monuments for this period is different; firstly, colour photos were made available with the advancement of photographic technology. Secondly, documentation relating to interventions was stored in the offices of the Cultural Heritage Organisation in Iran, along with photographic documentation. It is evident that Iranian experts brought forward the restoration and preservation campaigns, which began

²⁹ Olearius 1971, 476-479.

³⁰ Out of the Ilkhanid monuments, the most important preservation interventions were performed on the Isfahan Friday mosque (the Uljaytu mihrab), the Ushturjan Friday mosque, the Pir-i Bakran mausoleum, and the Garladan iwan.

³¹ See, for example: IsMEO 1980; Bernardini 1995.

³² See Isfahan *et al* 2010; Paone 1995.

during the two previous phases. It seems that the preservation experts' main task during this period was the up-keep of the Ilkhanid structures and performance of interventions concerning the protection of their interior architectural revetments. Important research and conservation interventions on the Ilkhanid monuments were mainly undertaken by different universities and offices of the Iranian Cultural Heritage, Tourism and Handicrafts Organisation (the ICHHTO). Among the publications discussions of minor Ilkhanid monuments by Yaser Hamzavi and Aslani³³ and Ilkhanid architectural revetments by Ahmad Salihi Khakhaki and Atefe Shekofte stand out.³⁴ Excellent archaeometric research of Iranian stucco composition and pigmentation traces for periods earlier than Ilkhanid was performed by Karimy and Holakooei.³⁵ Hopefully, a greater number of the Ilkhanid monuments is also going to be soon examined in this exemplary way.³⁶

1.2 Ilkhanid Monuments and their Chronological Context

Fig. 5.

Introduction

This section proposes a chronological framework of the monuments discussed in this research. It explains why some decisions for the divisions between different chronological periods have been taken. Moreover, it debates what the main historic characteristics of these periods were.

Periodization of Ilkhanid Monuments

Based on different characteristics of the Ilkhanid Empire through its history (rulers, official religion, military campaigns, economy) and in their connection to the Ilkhanid monument patronage, this research proposes a chronological division of the timeline of the Ilkhanid monuments into four distinct groups: Proto Ilkhanid monuments (1221-1256), Early Ilkhanid Monuments (1256-1295), Golden Period Ilkhanid monuments (1295-1316) and Late Ilkhanid monuments (1316-1335 and later). The proposed division is not optimal, but it serves to provide a framework for the discussion of the monuments and especially their quantitative research. In fact, as indicated below, the quantitative research of occurrence frequency of building and decorative activities changes between these periods and can be partially linked to the socio-political and economical changes within the Empire. Finally, it is possible to discern patterns of changes connected to monument patronage, construction and decorative activities which occurred through the history of the Ilkhanid reign. Moreover, each of these historic periods have their own characteristics, which are partially reflected in monuments, their stuccos and revetments of other media.

a.) Proto Ilkhanid Monuments (1221-1256)

Monuments of the formative period of Ilkhanid architecture are above all known from primary written sources (see Chapter 2; Section 2.2). Moreover, architectural revetments now in museum collections, such as the monumental lustre mihrab from the Maydan mosque in

³³ Aslani and Hamzavi 2012.

³⁴ Salihi 2007; Shekofte and Salihi 2014; Shekofte 2015.

³⁵ See for example: Karimy and Holakooei 2014; Karimy and Holakooei 2015.

³⁶ Furthermore, the first research of Ilkhanid wall paintings, along with restoration interventions in the city of Yazd, was undertaken by Hamid Farahmand Boroujeni, Abbas Abede Isfahani and Tahereh Shishehbori. Boroujeni *et al.*, 2013.

Kashan, in the Museum of Islamic Art, Berlin, dated 1226 (623 AH, Inv. No. I. 5366),³⁷ indicate that important constructive and decorative interventions took place in the initial period of the Ilkhanid reign. This is significant for two reasons.

This historic period began with the Mongol invasions of the Iranian territory and the neighbouring lands, which caused large-scale disruptions, damage to the urban infrastructure and partial interruption of communication routes. Following the Mongol conquest, the Iranian territory was first administered by the Mongol viceroys and subsequently by rulers of the Ilkhanid dynasty. This period was characterized by numerous and constant military activities which served for the consolidation of the Ilkhanid rule in the Iranian territory. The scale of destruction caused by the Mongol conquest and further military campaigns did not substantially affect monument patronage and production of architectural revetments. The collected evidence is significant, because so far, scholars mainly proposed that in the first decades after the Mongol invasion of Persia, monument building and artistic activities were at a standstill.³⁸ But in fact, the Ilkhanid rulers of the Iranian territory took over the existing infrastructure of these urbanised lands and enhanced it with patronage of monuments related to religious public spaces.³⁹ They also needed to establish the necessary infrastructure for the settlement of the new ruling elite to be able to control the territory pertaining to the Empire.

Moreover, the fact that there was no real interruption in artistic production and monument construction is of outmost importance for the understanding of Ilkhanid art and architecture. This research discusses the issue in further detail in the next chapters, but it is important to highlight here that the monument construction technology, architectural forms of monuments and technology for production of architectural revetments and also their visual characteristics, were taken over by Ilkhanid builders and artisans from their predecessors. The research shows that this process of “inheriting” the architectural and artistic forms and technology had to occur in a direct manner; the necessary knowledge and skills had to be learned directly from the experts by means of apprenticeship. This additionally supports the proposed hypothesis indicating that the break between pre-Ilkhanid and Ilkhanid monument construction and production of architectural revetments as well as objects of art, must have been minimal and could not have lasted beyond a generation.

³⁷ Ritter 2018; [http://www.smb-digital.de/eMuseumPlus?service=direct/1/ResultLightboxView/result.t1.collection_lightbox.\\$TspTitleImageLink.link&sp=10&sp=Scollection&sp=SfieldValue&sp=0&sp=0&sp=3&sp=Slightbox_3x4&sp=0&sp=Sdetail&sp=0&sp=F&sp=T&sp=2](http://www.smb-digital.de/eMuseumPlus?service=direct/1/ResultLightboxView/result.t1.collection_lightbox.$TspTitleImageLink.link&sp=10&sp=Scollection&sp=SfieldValue&sp=0&sp=0&sp=3&sp=Slightbox_3x4&sp=0&sp=Sdetail&sp=0&sp=F&sp=T&sp=2) (Last Accessed: June 8, 2021).

³⁸ See, for example, Brambilla 2012.

³⁹ See, for example, the long history of the Tabriz Friday mosque or the Isfahan Friday mosque and their complex constructive and decorative interventions chronology. Cat. Nos. 1, 24.

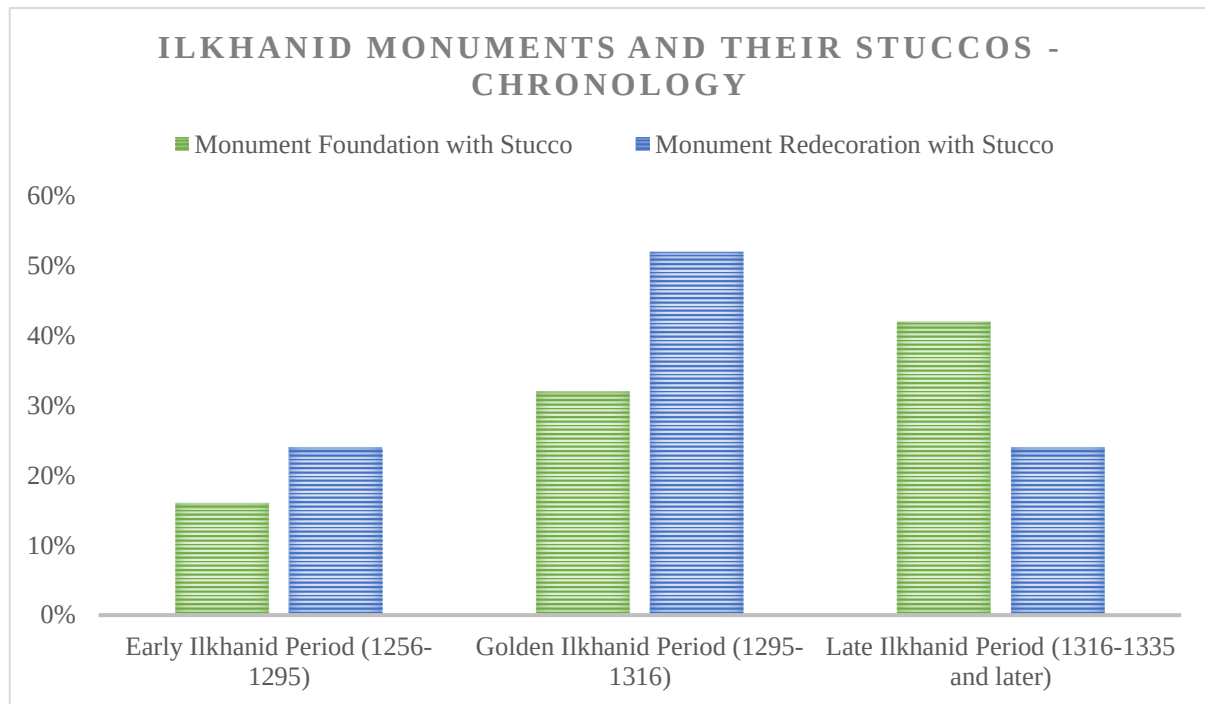


Figure 5: Information concerning occurrence of monument construction and redecoration activities which comprised production of carved stuccos in the chronological context (out of 120 monuments).

b.) Early Ilkhanid Monuments (1256-1295)

Early Ilkhanid monuments were built during the reigns of the first Ilkhanid rulers and at the time when the official religion of the newly formed Empire was still Buddhism. The main concerns of these rulers were to retain the integrity of the Empire and to try to further expand it. Accordingly, although the Iranian territory was officially already conquered, still, numerous military conflicts occurred, which affected the urban infrastructure and communication routes. The taxation system was not yet reformed and it was a heavy burden on the population and at the same time it did not result in a substantial economic growth of the Empire, which could be indirectly connected to monument patronage.

Slightly less than a fifth of all the Ilkhanid interventions on monuments took place in this period. Among these, only around one third of the monuments were actual *ex novo* constructions and the other two thirds comprised modifications of earlier existing monuments which could consist of rebuilding, enlargement and redecoration of their architectural structures. This indicates that the Ilkhanid patrons were pragmatic in their approach to the existing infrastructure and the need for its development. Rather than building new monuments, which served as urban infrastructure, the patrons focused on patronage of monuments which were already in place; they improved this infrastructure by additions, rebuilding and change of their function to serve the population. Patronage of architectural revetments with epigraphic programmes communicating their meaning and function was of particular significance in this process of assertion of political power by patrons through pious acts of patronage centred onto public spaces and thus imprinting the Ilkhanid dominance into the shared memory of the Iranian population.

c.) Golden Period Ilkhanid Monuments (1295-1316)

The Golden period of Ilkhanid monument patronage is marked by the rules of Ghazan Khan (r. 1295-1304) and Sultan Uljaytu (r. 1304-1316). One of the most significant differences, compared to the earlier periods of the Empire, is the fact that Islamic religion was adopted as the state religion with Ghazan Khan's conversion to Sunni Islam. This definitely impacted the increase in patronage of Ilkhanid religious monument construction and modifications of earlier religious structures. The period marked the end of the significance of Buddhist religion, and significance of religious minorities (Christians and Jews), who were first persecuted and tolerated later, decreased. Another further characteristic of this period were Ghazan's reforms of the taxation system, the administration, and other aspects of the Empire. These reforms enabled for the accumulation of wealth within the Empire which determined the increase in activities of monument patronage. This was also a period of the Empire's relative stability which was important for monument and arts' patronage.

Scholars have in fact considered this time span as the most significant for the Ilkhanid monument construction. A closer look at the chronological context(s) of monument construction trends during the Ilkhanid Empire (see Chapter 1; Section 1.7) however indicates that out of all constructive and decorative interventions of the Ilkhanid period, less than half took place in the given chronological frame. The Late Ilkhanid period was in fact almost of equally significant moment in monument patronage and production of objects of arts. The monument patronage activities of the Golden Ilkhanid period are characterized by a similar ratio between new foundations and rebuilding and redecoration campaigns: only a third of monuments was built anew and the rest were earlier structures modified by rebuilding, repairs and redecoration. The frequency of redecoration activities was partially influenced by the Uljaytu's conversion to the Shi'ite creed in 1309 and consequent change of the official religion of the Empire, which was communicated to the faithful via the new aesthetics and modified epigraphic repertoires of architectural decorative programmes on the monuments.

d.) Late Ilkhanid Monuments (1316-1335 and later)

The late Ilkhanid period is marked by the reign of Abu Sa'id and the subsequent decades of gradual disintegration of the Ilkhanid Empire. Scholars have regarded this chronological unit as the time in which the centralized power of the Ilkhanate and the economic situation of the Empire began to decline. This is to a large extent correct, but it did not have the immediate effect on the patronage of the Ilkhanid monuments, as indicated in this research. Moreover, many architectural forms and revetment media, which developed in previous Ilkhanid periods and acquired distinctively Ilkhanid aesthetics, partially determined by their innovative production procedures, continued to be built and produced in this period.

The Late Ilkhanid period is characterized by the prevalence of *ex novo* monument constructions over rebuilding and redecoration of existing monuments (Fig. 5). Around two thirds of monuments, including monumental structures, were built anew and only a third of undertakings were performed on extant structures. Following the technological inventions in the Golden Ilkhanid period, the Late Ilkhanid monuments also often feature new types of architectural revetments, such as wall paintings combined with applied moulded and stencilled stuccos. Architectural forms of pious complexes were built more frequently, compared to earlier periods. Monuments built in the decades following the rule of Abu Sa'id had different patrons: these were mainly politically significant figures of the newly emerging local dynasties such as the Muzaffarids in Yazd. Monument patronage, especially construction of monuments *ex novo* was

of essential significance for these patrons to bolster their political power and to determine new urban structures of the most significant settlements.

1.3 General Characteristics of Ilkhanid Monuments and their Architectural Revetments

Figs. 6-10.

Introduction

This section provides information concerning some general characteristics of the Ilkhanid monuments and their architectural revetments, with a focus on carved stuccos. It puts forward research of the geographical occurrence of monuments and stuccos in diverse periods of the Ilkhanid Empire's history (see above). In doing so, it proposes a general picture and context for a more detailed discussion and examination of Ilkhanid monuments with carved stuccos in the following chapters of the research.

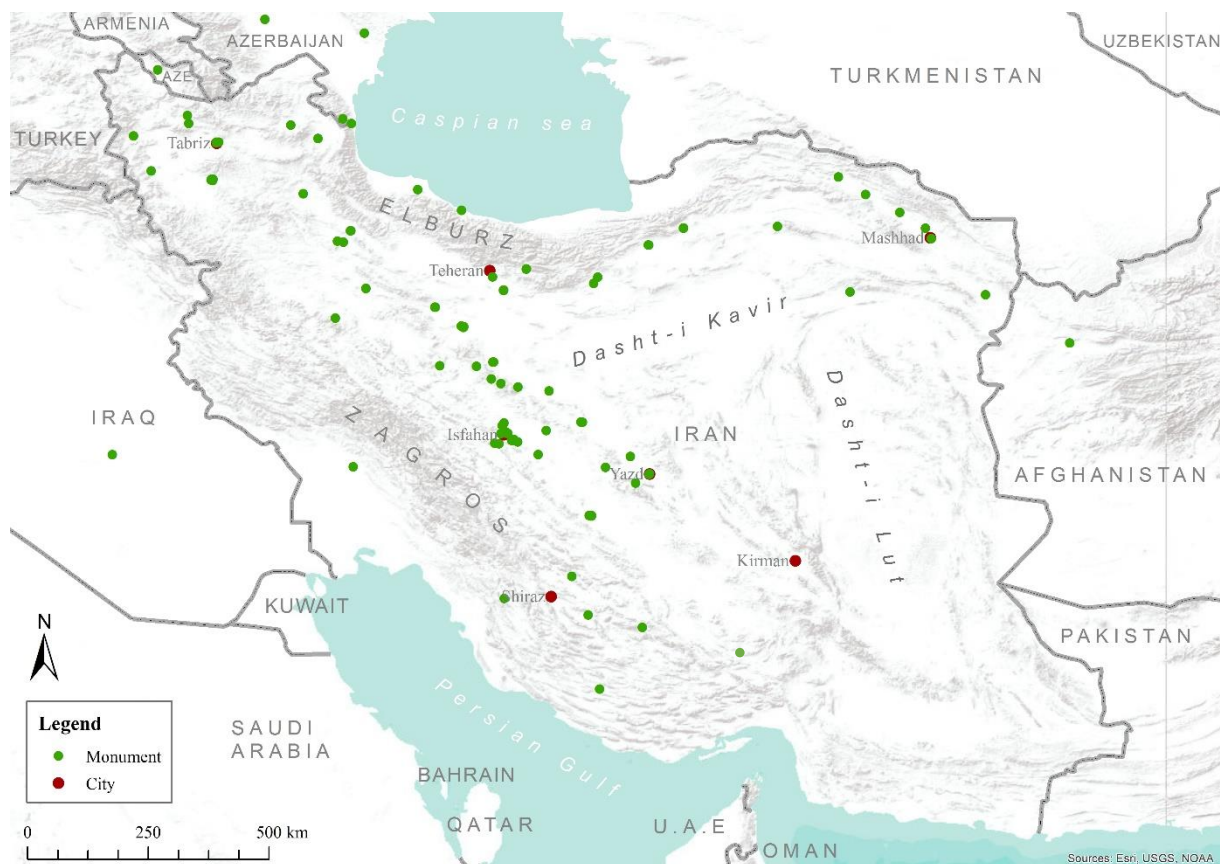


Figure 6: Map showing geographical locations of Ilkhanid monuments which were constructed or decorated between 1256 and 1335.

Ilkhanid Monuments and their Geographical Distribution

This research focuses on carved stuccos of the Ilkhanid period and their architectural context, but wider research on the Ilkhanid monuments has been performed in order to focus on selected monuments and to provide a context for their discussion. Field research for monument documentation, and research of publications and written sources concerning the Ilkhanid monuments, enabled for the establishment of a database which comprises information about some 120 monuments, which were either built or (re)decorated with architectural revetments in different decorative media. These research findings provide a new understanding of Ilkhanid

building activities and interventions of monuments' redecoration. Information concerning no longer existing or not located monuments is also significant because it further illustrates the extent and nature of Ilkhanid building activities.

The analysis of geographical locations of these monuments has been put in place in order to discern patterns of monument distribution across the Ilkhanid territory. The majority of the monuments is located in the centre of the Iranian plateau, in the area stretching from the regions south of Shiraz to the proximities of Teheran. Regions with a specific density of monuments comprise the area of Isfahan (which for a long time presented focus of this research) and area between Natanz and Qum. Further areas of the Ilkhanid Empire with a considerable amount of Ilkhanid monuments comprise north-eastern and north-western Iran. The Ilkhanid monuments are only occasionally encountered in the area of south-eastern Iran and Khuzistan. Some monuments were built in the areas beyond borders of present day Iran, reflecting the boundaries of the Ilkhanid Empire: Caucasus (modern Nakhchivan and Azerbaijan) was a particularly significant geographical unit and there are several monuments located in the territory of Iraq and some in Afghanistan. These monuments are rarely addressed by Iranian scholars who focus on Ilkhanid monuments located within the modern national borders of the Islamic Republic of Iran, rather than considering monuments of the Ilkhanid period within the territory of Iran and the neighbouring lands, which constituted the Ilkhanid Empire. Listed information concerning the geographical distribution of the Ilkhanid monuments and redecorated older monuments contrasts the common scholarly assumption that the core of the Empire was mainly and above all north-western Iran.⁴⁰ This might be correct in regards to the seasonal migration routes of the Ilkhans, but patronage of monuments was an activity which took place in all geographical units of the Empire, particularly urbanized areas.

The geographical distribution of the Ilkhanid carved stucco revetments is however different. Carved stucco repertoires of the Ilkhanid period are concentrated in central Iran, especially in the area between Isfahan, Qum and Varamin and a considerable number of carved stuccos is located in north-western and north-eastern Iran. In the area between Na'in, Yazd and Abarquh, wall painting and applied moulded and stencilled stuccos prevailed over carved stuccos. Moreover, the southern part of Iran was characterized by predominance of carved stone revetments rather than stuccos or stucco-derived decorative media. Two main factors which conditioned geographical distribution of carved stuccos have been discerned during the course of this research. The first factor was the local availability of gypsum material; carved stucco repertoires are only exceptionally found in regions remote from sources of primary material. The other significant factor was the availability and mobility of craftsmen skilled and able to produce stucco repertoires.

⁴⁰ Compare to Wilber 1955, 8-9, 14, 17-22, see especially 88-89.

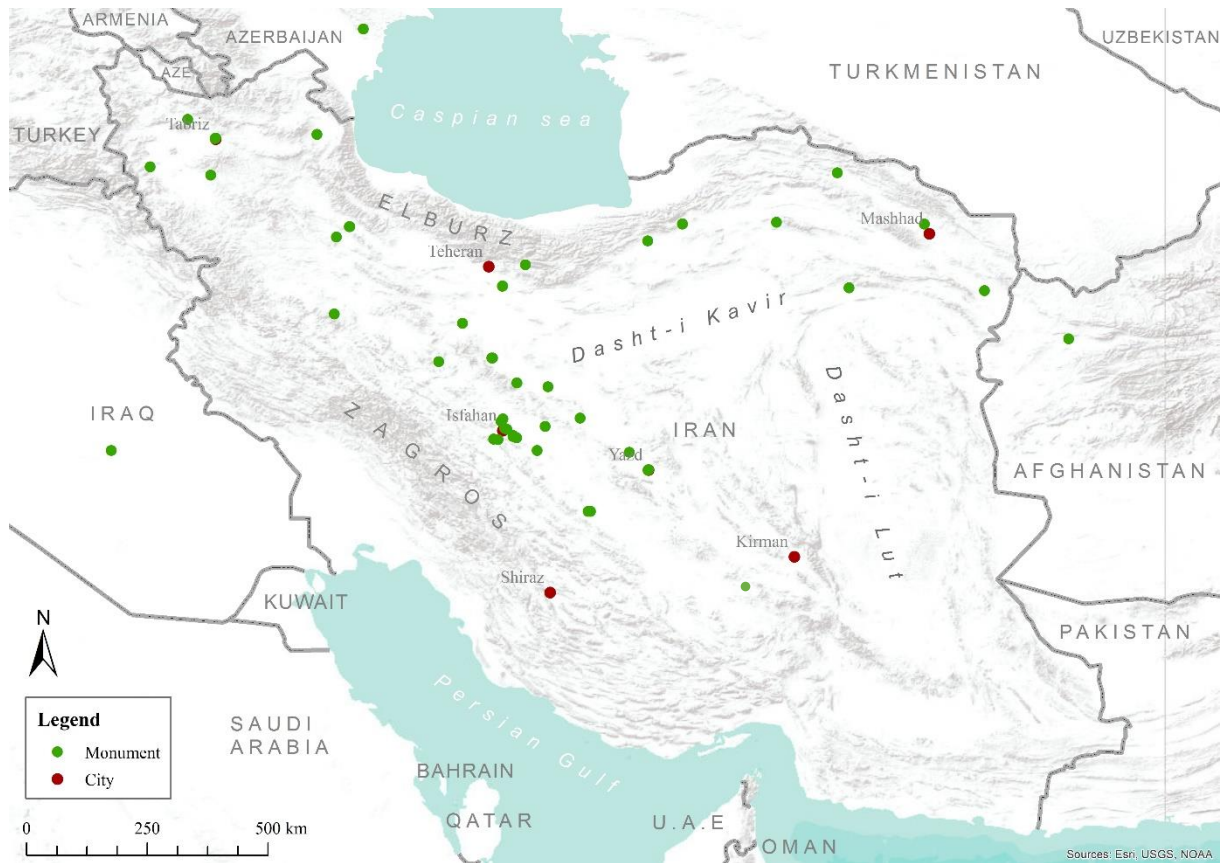


Figure 7: Geographical locations of documented carved stucco repertoires of the Ilkhanid period (1256-1335).

Ilkhanid Monuments and Redecoration Activities

One of the specific characteristics of the Ilkhanid architectural activities, which sets them apart from the pre-Ilkhanid building undertakings, is the frequency of redecoration interventions on pre-Ilkhanid monuments. These interventions could be combined with building activities of monument enlargement or rebuilding, or they could be independent non-structural interventions consisting of sole production of new architectural revetments. Such interventions comprise production of architectural revetment programmes which were produced out of diverse media of architectural decoration, such as carved stuccos, wall paintings, applied moulded and stencilled stuccos, lustre tiles, Lajvardina tiles, moulded and glazed tiles or glazed tiles. These interventions were a phenomenon which occurred throughout the Ilkhanid Empire. But the most significant monuments, such as larger pilgrimage complexes or funerary structures were a focus of continuous redecoration interventions, compared to less significant monuments.

Quantitative analysis of Ilkhanid architectural structures, presented in detail in Chapter 4, Section 4.1, provides information concerning the frequency of occurrence of these decorative interventions in relation to regular activities of monument construction. It indicates that for the production of carved stuccos, half of the interventions were redecoration interventions and only one-half of carved stucco repertoires was produced for newly built monuments. This is different, compared to the pre-Ilkhanid periods; this frequency of monument redecoration should be considered as an important aspect of Ilkhanid architecture. Moreover, the frequency of these decorative interventions fluctuated through the time of the Ilkhanid reign, based on needs for new public infrastructure; stucco revetment production during the Ilkhanid period is

above all related to extant religious monuments, such as mosques, pilgrimage complexes, *khanqahs* and mausolea.



Figure 8: Geographical locations of documented Ilkhanid constructions *ex novo* and redecoration interventions on monuments (1256-1335).

Redecoration interventions were more frequent, compared to the construction of new monuments until the end of Sultan Uljaytu's rule (r. 1304-1316). Only subsequently, the frequency of redecoration interventions decreased on account of construction of monuments *ex novo*. This is informative of building trends by Ilkhanid patrons and related to changes of socio-political (e. g. ruler's religious confession) and economic character (availability of funds for monument construction). In the initial period, until around 1295, more monuments were redecorated than built, due to the reuse of the existing architectural infrastructure. In the period of Ghazan's and Uljaytu's reigns, between 1295 and 1316, construction of *ex novo* monuments became more frequent, although redecoration interventions were still numerous. This changed in the period of Abu Sa'id's reign and in the first decades following it. In that period, public infrastructure of the Empire's urbanized parts was already in place and new monuments were being built, but less redecoration interventions were performed. Moreover, the new local dynasties such as the Muzaffarids, gave way to construction of monuments within their territories which enabled for their political figures to assert their power also by the means of new pious endowments.

This frequency of redecoration interventions during the Ilkhanid period stems from the function of architectural revetments themselves; it is tied to their meaning and function which reflect the socio-political changes within the Empire, as the time passed and in comparison to earlier rules in the Iranian territory. These architectural revetments carried their meaning and function in

their artistic forms and especially in their epigraphic programmes. Their application on surfaces of existing monuments, combined with structural modifications, could transform or at least impact the function of monuments. Their epigraphic repertoires with religious and historic inscriptions inform about the ambitions and political power as well as piousness of their patrons, and the religious inscriptions reflect the official religion and religious climate in the period when these revetments were produced. Architectural revetments and decorative interventions on monuments, which functioned as the focal loci of communities – public spaces and places of collective memory, thus functioned as the medium of communication between the ruling elite of the Empire and its subjects. Architectural revetments communicated religious policies of the Ilkhans and political power of the patrons. An extensive group of these interventions might have been produced in the period following Uljaytu's conversion to the Shi'ite faith, and these revetments explicitly express their Shi'ite content. Redecoration interventions often changed the aesthetic appearance of the monuments' interiors, which was due to the difference in their production technology and artistic style, compared to earlier revetments in the monuments. It remains unclear whether such aesthetic changes were desired or if they were simply a consequence of the fact that different artistic media were employed for these decorative programmes. In some cases, the aesthetic change might have functioned in highlighting the new message of the epigraphic repertoire to the faithful.

Craftsmen's Signatures on Ilkhanid Architectural Revetments

Some general information concerning the occurrence of architectural revetments' craftsmen's signatures in the Ilkhanid period has been discovered by the geo-localised research of the 120 monuments. Further information focusing on signatures in Ilkhanid carved stuccos is discussed in Chapter 4, Section 4.2.

Some of the architectural revetments of the Ilkhanid period, such as lustre tiles, were produced with the artistic techniques and technologies passed to Ilkhanid artisans from their predecessors. Other techniques, such as Lajvardina (gilded glazed tile revetments) were Ilkhanid inventions. For carved stucco, many artistic techniques and visual features were already in use in the pre-Ilkhanid times, but further technological and visual inventions were put in place by Ilkhanid stucco craftsmen. One of the major inventions is the new decorative medium of applied moulded and stencilled stuccos which were frequently combined with wall painting medium.

Ilkhanid architectural revetments were frequently signed, by heads of workshops which produced them and occasionally by people responsible for their inscriptions or other aspects of their production. Generally speaking, the frequency of occurrence of signatures on Ilkhanid revetments is considerably higher, compared to the pre-Ilkhanid periods. It however varies from decorative medium to medium. Applied stencilled and moulded stuccos, glazed and moulded tiles and Lajvardina tiles seem not to have been signed. On wall paintings, signatures occur only seldom. In contrast, the most frequently signed works are those in lustre medium. Woodworks were also signed. For carved stucco, some 40% of repertoires are signed, which is unprecedented, given that there is a total of three known signatures in carved stuccos of the pre-Ilkhanid period. These signatures are often written in *Naskh* and placed on the focal points of revetments or their visible parts, indicating that they were meant to be seen and read, rather than being concealed graffiti of the artisans.

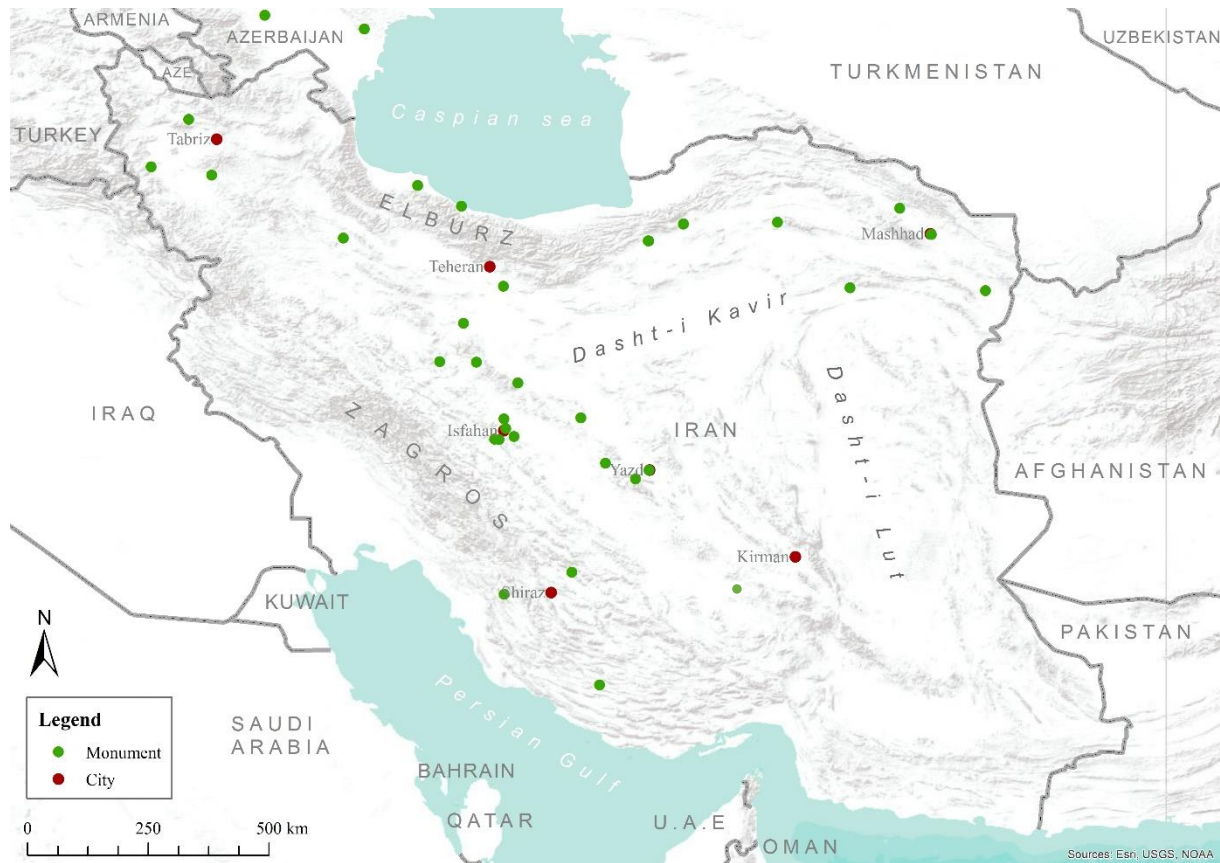


Figure 9: Geographical locations of documented craftsmen's signatures of Ilkhanid architectural revetments in different media (1256-1335).

This frequency of occurrence of signatures on Ilkhanid stucco revetments signals a change in the social status of craftsmen. The craftsmen might have turned into more significant parts of the society, due to the importance of their work tied to their patronage. The irregular frequency of occurrence of these signatures from among the decorative media might however reflect differences in adopted practices of different workshops. The described frequency of signatures is characteristic of the Ilkhanid revetments and especially carved stuccos. This trend continued in the Timurid and Aq Qyunlu periods, when signatures became even more frequent, larger, placed on the most significant parts of monuments and more developed in terms of their length and titles of artisans (see below, Section 4.2).

The Evidence Concerning the Carved Stucco Production

This research discusses technology and artistic techniques employed by Ilkhanid craftsmen, for production of carved stuccos (see Chapter 3, Section 3.1). It is sufficient to note here that the research makes a significant step towards a better understanding of the Ilkhanid stucco production technology by documenting and tracing the design outlines of stuccos. These outlines were discovered on the surfaces of carved stuccos, on an extensive number of repertoires, which are distributed evenly across the Ilkhanid Empire's territory. These outlines could be either direct incisions of the design, employed for architectural forms of revetments and angular scripts, or painted outlines for round scripts and visual elements of vegetal or geometric origin. This indicates that the outlining practices for stuccos were common knowledge of the Ilkhanid stucco craftsmen. Moreover, discoveries of similar outlines on a

considerable number of pre-Ilkhanid stuccos, indicates that this practice, which was part of technology for production of carved stuccos, stems from a long-standing tradition of stucco art.

Ilkhanid Stucco Artistic Techniques and their Geographical Spread

This research indicates that there was no substantial break in production of carved stuccos between the Ilkhanid and pre-Ilkhanid periods. The art of the Ilkhanid stucco and the knowledge necessary for its production was transferred between generations of craftsmen within the framework of stucco craftsmen's workshops. Nevertheless, new artistic techniques and approaches towards production of stuccos were put into practice during the Ilkhanid period. This research explains in detail that selected knowledge for stucco production and the bulk of technological approaches and stucco artistic techniques were in the gift of every stucco workshop. A certain level of secrecy might have been involved in determining the differences in stucco production knowledge of every stucco workshop, which, as shown in this research, worked independently from each other and from the majority of workshops in charge of production of architectural revetments in other decorative media. Some stucco technology production approaches developed during the Ilkhanid period enabled for the invention of new stucco artistic techniques and determined the distinctive features of aesthetics of the Ilkhanid stuccos. Accordingly, the mobility of workshops can to a certain extent be understood based on observations of production of stuccos, the employed technology and artistic techniques. Some of these were part of the long-standing tradition and a common know-how and the others were specific to workshops.

The geographical distribution of diverse artistic techniques differs from case to case. Ilkhanid stuccos are characterized by distinctively deep stucco relief, which comprises a large number of protruding elements. This feature is present in the majority of the Ilkhanid Empire's territory and on a large number of monuments, indicating that the know-how of such stucco production spread across the territory with mobile stucco craftsmen's workshops. Similar can be stated for applied protruding elements, which are found in the majority of the Ilkhanid stucco repertoires in different geographical areas. This artistic technique, of producing circular protruding bosses and elements of abstracted vegetal forms and applying them on stucco reliefs, seems to have been widespread. A specific stucco artistic technique invented during the Ilkhanid period was stucco undercutting, which enabled production of visually dynamic stucco reliefs. This technique was partially limited to a smaller number of stucco repertoires and especially for stuccos in central Iran. In addition to this, a technique which required a combination of glazed tiles and carved stuccos seems to have been in circulation in the Isfahan area. One of the decorative media, which is only loosely related to carved stuccos, but aesthetically often mimics them, were the applied moulded and stencilled stuccos. This separate decorative medium and artistic technique seem to have been invented in Ilkhanid period, and had a very limited circulation, which indicates the mobility routes of craftsmen who had the know-how to produce such revetments. It seems that the second decorative stage at Sultaniyya (Cat. No. 27), which necessitated covering of extensive architectural surfaces, aided the development and perhaps fostered invention of this decorative medium which could often be combined with wall paintings. Subsequently, such revetments are found only in the area south of Isfahan and on a specifically extensive scale in Muzaffarid Yazd, where these revetments continued to be produced and where they could originate from (Cat. No. 29). Similar to these revetments, the decorative medium of wall painting illustrates that its spread was limited and tied to mobility of craftsmen.

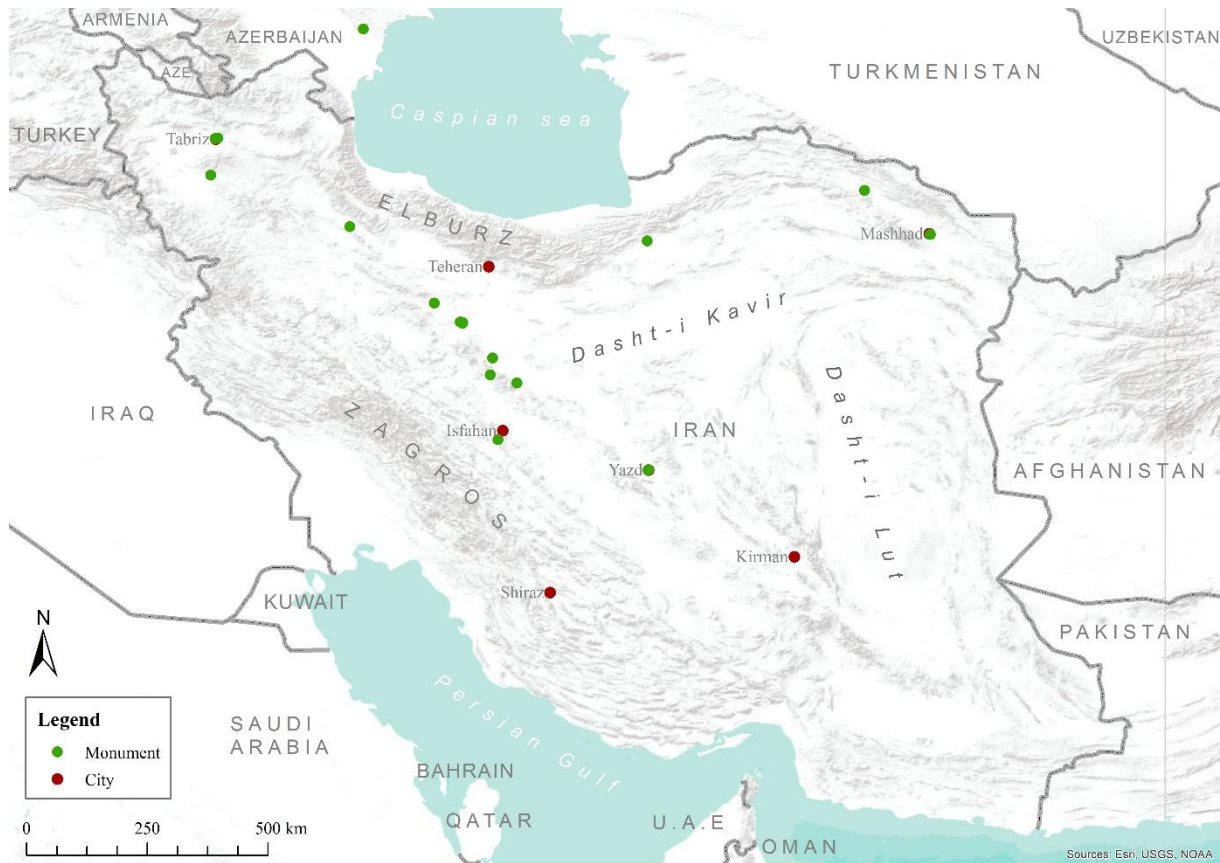


Figure 10: Location of documented Ilkhanid monuments with lustre tile revetments (1256-1335).

Ilkhanid Lustre Tiles and their Monuments

One of the significant characteristics of Ilkhanid monuments is that their architectural revetment programmes are often produced in several decorative media, which are either works of different or joint decorative interventions. In addition to carved stuccos, wall paintings and applied moulded and stencilled stuccos, an important part of the revetments consists of tiles. These tiles could be produced in different decorative media: glazed and moulded, Lajvardina, glazed and terracotta elements combination and lustre tiles. It has been mentioned that lustre tiles were above all employed for interiors and the rest of the tile media were preferred for external architectural surfaces, but there are also some exceptions to these patterns of occurrence and use of decorative techniques.⁴¹ Differently from carved stuccos, wall paintings and applied moulded and stencilled stuccos, tile revetments, especially those in lustre technique, had to be produced in a workshop with specific types of kilns (for lustre firing, kilns with reduction atmosphere), and could thus not be produced in the proximities of monuments, such as other tile revetments.⁴² The main production centre of lustre revetments was Kashan, from where the produced tiles forming mihrabs, cenotaph covers and decorative dado area friezes were shipped to monument sites. The equilibrium between their pre-fabrication and custom made revetments

⁴¹ One of the most significant exceptions is for example the strapwork revetment programme in the core of the octagonal structure of Uljaytu mausoleum at Sultaniyya, where the first decorative phase was produced with glazed and terracotta elements (Cat. No. 27).

⁴² At the site of Takht-i Sulayman, kilns for production of ceramic (but not lustre) revetments were discovered during the German excavations. Naumann and Naumann 1976; <http://archnet.org/sites/3882> (Last Accessed: April 31, 2021).

is still not well understood. These revetments formed either independent decorative programmes, or they could be selectively employed in more extensive decorative repertoires only for the focal points of monuments' interiors. They were frequently used on monuments in proximity to their production centre, Kashan, but they were in several cases shipped to distant monuments. This might indicate that lustre tiles were recognized as luxurious, expensive and aesthetically pleasing revetments of the Ilkhanid period. Recent research also indicates that these revetments were frequently re-used already during the Ilkhanid period.⁴³ Further research is necessary to establish the function and significance behind the presence of such revetments with animate imagery in Ilkhanid religious structures.

1.4 Ilkhanid Art and Architecture – Some Remarks

Introduction

This section debates some of the most significant traits of Ilkhanid architecture. It begins with some remarks concerning Ilkhanid architecture and its significance within the context of the history of Islamic art and architecture. It provides some information concerning general differences between the Ilkhanid and pre-Ilkhanid architecture in order to delineate the main distinctive features of Ilkhanid art. It continues by putting forward information concerning Ilkhanid monuments, which were pinpointed during the research, based on primary and secondary sources. It proposes some remarks concerning the statistics of their occurrence, according to the time of their construction and their function. This chronological framework serves for the discussion of monuments and their stuccos. The third and the last section of the unit provides quantitative information regarding the occurrence of carved stucco repertoires in the Ilkhanid monuments, according to their function and architectural form, and the type of intervention. The gathered data enables a better understanding of chronological and geographical context for construction or redecoration activities on Ilkhanid monuments, their function and the relation of carved stucco revetments to these monuments.

a.) Some Observations of Characteristics of Ilkhanid Architecture

Although the Ilkhanid dynasty was relatively short-lived (1256-1335), it constitutes one of the essential periods in the history of Iranian art and architecture due to its superb and intriguing material culture. Notwithstanding that the majority of extant Iranian Ilkhanid monuments is located in its north-western part of Iranian territory, corresponding to the three Ilkhanid capitals (Maragha 1256-1265; Tabriz 1265-1306; Sultaniyya 1306-1335),⁴⁴ a considerable amount of important Ilkhanid structures and production centres were also constructed or located beyond the borders of modern Iran (e.g. Khan al-Mirjan⁴⁵; 1359; Baghdad, Khanqah of Pir Husayn, Cat. No. 25). Later Ilkhanid buildings were constructed during the reign of the last Ilkhanid ruler Abu Sa'īd upon whose death in 1335 the Empire rapidly disintegrated into several rival states.⁴⁶

The *Pax Mongolica* gave an unprecedented impetus to religious, cultural and material exchange in the area between the Far East and Asia Minor. The three main factors that determined the Ilkhanid innovative artistic vocabulary are: Ilkhanid religious eclecticism, artistic influence

⁴³ See, for example, Donabédian and Porter 2017.

⁴⁴ Morgan 1986, 163-171. See also Morgan 1988.

⁴⁵ Uluçam 1989, 166-169; <http://archnet.org/sites/3845> Last Accessed: April 13, 2021.

⁴⁶ Blair 1986a, 170-174.

from Central Asia and China and the Great Seljuq artistic and architectural legacy.⁴⁷ Surviving masterpieces of book, metal, textile, ceramic and jewellery production testify that the demand by the high-ranking strata of the society fostered the development of artistic techniques and boosted the productivity of already existing artistic centres.⁴⁸ These objects were either used in the daily life of the court, or they served for ritual display of power and wealth of Ilkhanid ruling classes and for their legitimization.

Ilkhanid book arts are perhaps best understood art forms of the dynasty, due to their presence in numerous Western collections, generated by the dispersal of Ilkhanid manuscripts. This is best exemplified by the sumptuous *Great Mongol Shahnama* (commissioned by Abu Sa'id?) and by several copies of Rashid al-Din's *Jami al-Tawarikh* (Compendium of Histories), commissioned by Ghazan Khan.⁴⁹ Manuscripts produced in Mosul, Baghdad, Tabriz and Shiraz, and metal objects manufactured mainly in Mosul are results of long-standing crafts tradition from the Seljuq and earlier periods.⁵⁰ The art of textiles imported from China into Iran and paper availability for internal circulation in Iran perhaps served as the medium for the transmission of Chinese motifs into the Ilkhanid artistic vocabulary. Among the most visible Chinese elements in Ilkhanid art are floral motifs of peonies and lotuses, Chinese clouds and mountains and mythical animals such as the dragon and the phoenix. This is a peculiar but not only an Ilkhanid exception to more frequent practices of the avoidance of depictions of human and animal figures in religious art and architecture in Islamic cultures.

Ilkhanid architectural legacy comprises a range of different structures from imperial palaces, and complexes to commissions of caravanserais, mosques, madrasas, *khanqahs*, mausoleums and tomb towers.⁵¹ The Ilkhanid period witnessed an unprecedented increase in construction of Sufi shrines and *imamzadas* (shrines for descendants of Twelve Imams).⁵² Another peculiarity of the period consists of frequent interventions in interior redecoration of Ilkhanid or earlier structures (for example Uljaytu's tomb at Sultaniyya; Cat. No. 27, or the Pir-i Bakran mausoleum south of Isfahan; Cat. No. 2). Although Ilkhanid architecture is not considered to be original in use of architectural elements, this dynasty creatively developed architectural models established by the Great Seljuqs. This is perhaps most evident in the architectural proportions as a stronger emphasis on the vertical axes of monuments.⁵³ The refinement of architectural transitional zones resulted in an increased decorative use of muqarnas. The use of mosque portals with double minarets (e.g. the Garlidan *Iwan* in Isfahan; 1315,⁵⁴ the Friday mosque of Yazd; 1324, 1365,⁵⁴ and the Friday mosque of Abarquh; 1337-38; Cat. No. 10) continues from the Seljuq period. Ilkhanid architecture is often described as massive in size, although this is perhaps only true for imperial commissions such as the cities of Ghazaniyya; 1297-1305⁵⁵ and Rabi-i Rashidi -Rashidiyya,⁵⁶ c. 1300 near Tabriz, the Uljaytu mausoleum at

⁴⁷ Komaroff and Carboni, 2002, 168-195.

⁴⁸ *Ibid.*, 2002, 74-103.

⁴⁹ Perhaps the best known version of the Persian national epic, The Book of Kings, composed by Ferdowsi between circa 977 (366 AH) and 1010 (400 AH). See also Blair 1995; Komaroff and Carboni, 2002, 145-150.

⁵⁰ Komaroff and Carboni 2002, 197-222.

⁵¹ Hillenbrand 1994, 106-107.

⁵² *Ibid.*, 107.

⁵³ Wilber 1955, 152-154; http://archnet.org/sites/5455/media_contents/41015 (Last Accessed: April 31, 2021).

⁵⁴ Pope and Ackermann 1977[1938-39], Vol. 3, 1091-1093; <https://www.archnet.org/sites/1691> (Last Accessed: April 31, 2021).

⁵⁵ Wilber 1955, 124-126; <http://archnet.org/sites/1677> (Last Accessed: April 31, 2021).

⁵⁶ *Ibid.*, 129-131; <http://archnet.org/sites/3884> (Last Accessed: April 13, 2021).

Sultaniyya; Cat. No. 27, and the Ilkhanid summer place at Takht-i Sulayman;⁵⁷ all located in north-western Iran. Although the significance of these structures in pushing the boundaries of architectural dimensions should not be undermined,⁵⁸ the vast majority of the Ilkhanid monuments assumed medium or small dimensions, compared to the listed monumental commissions.

Ilkhanid ground plans and architectural solutions were adopted from earlier Seljuq structures. The most prominent mosque model comprised the following traditional elements: the four-*iwan* cum open courtyard, the domed *qibla* chamber with mihrab supported by a drum and squinches.⁵⁹ It is best exemplified by the Varamin Friday mosque (1322-1326, Cat. No. 28). The Seljuq tomb tower and domed structures of more squat proportions became less and less common and, eventually, they gave way to diverse types of funerary structures. The builders' versatility emerged most prominently in Ilkhanid mausolea. The most significant types of these mausolea are single-monumental-*iwan* (e.g: the Pir-i Bakran mausoleum in Linjan; Cat. No. 2), domed- square (e.g. the Shrine of Bayazid Bistami in Bistam; Cat. No. 19), octagonal (e.g: Gunbad-i Sabz in Qum; 1360-1390; Cat. No. 15) and polygonal domed structures (e. g: the Kashana tomb tower adjoining the Friday Mosque of Bistam; 1313; Cat. No. 18). These funerary structures were commissioned for the commemoration of prominent Ilkhanid personages tied to the court and religious figures from Ilkhanid or earlier times. Numerous such structures still present a challenge to the researchers. The original function of the Haruniyya at Tus (early fourteenth century)⁶⁰ is still debated; the structure might have been a *khanqah* or a mausoleum. The mausolea often functioned as embryos of multi-purpose complexes as in the case of: Bistam (Bayazid Bistami complex; Cat. No. 19), Ardabil (Shaykh Safi al-Ardabil; 1334; 1350-),⁶¹ Natanz ('Abd al-Samad complex; 1304-1325; Cat. No. 12) and Turbat-i Jam (Turbat-i Shaykh-i Jam complex; 1236; 1320-1333; Cat. No. 30). The most dynastically distinctive feature of Ilkhanid structures is, nonetheless, their internal and external architectural revetment repertoires.

Iran experienced a short but extremely productive period of cultural, artistic and architectural flourishing during the Ilkhanid rule. Seljuq artistic and architectural legacy evolved into an aesthetically different architecture, which was determined by the Ilkhanid creative syntax of architectural elements and architectural revetments. For example, compared to the Seljuq period, Ilkhanid architectural revetments were more independent from the architectural structure. These structures were sumptuously adorned with first-rate revetments and supplied with luxurious objects produced in the finest manner. They testify to the wealth and erudition of numerous and often anonymous Ilkhanid patrons. Further research is, however, needed for the understanding of Ilkhanid patronage. Moreover, the function and meaning of countless structures and architectural revetments still lack a consistent scholarly understanding. Ilkhanid syncretism of artistic motifs with earlier Iranian architecture occurred via the circulation of artists, craftsmen and builders through the vast geographical area unified by Genghis Khan and his successors. In consequence of these unique conditions, Ilkhanid material culture stands out as a unique achievement in the history of Islamic art and architecture. The significance of the

⁵⁷ Naumann and Naumann 1976; <http://archnet.org/sites/3882> (Last Accessed: April 31, 2021).

⁵⁸ Brambilla 2012, 6-16.

⁵⁹ Hillenbrand 1994, 106-107.

⁶⁰ Wilber 1955, 145-146; http://archnet.org/sites/3885/media_contents/62839 (Last Accessed: April 31, 2021).

⁶¹ Rizvi 2011; <http://archnet.org/sites/1595> (Last Accessed: April 13, 2021).

Ilkhanid artistic and architectural development is illustrated in its impact on Timurid and Safavid material culture.

b.) Chronology of Ilkhanid Monument Construction

Patronage of monuments in the chronological context has been divided into four groups: Proto Ilkhanid monuments (1221-1256), Early Ilkhanid monuments (1256-1295), Monuments of the Golden Ilkhanid period (1295-1316) and Late Ilkhanid monuments (1316-1335 and later). Traditionally, the scholars considered the reigns of Ghazan Khan (1295-1304) and of Sultan Uljaytu (1304-1316), here labelled as the monuments of the Golden Ilkhanid period (1295-1316), to be the period during which construction and decoration of monuments was frequent and of more extensive dimensions. Administrative reforms of Ghazan Khan, which also comprised the construction sector allowed for the accumulation of wealth within the Empire, which enabled the patronage of monuments to flourish. This accumulation of wealth reflected itself fully during the reign of Sultan Uljaytu, when monument patronage was more frequent. The research of monuments and the quantitative analysis of data concerning the time of their patronage and the time of production of carved stucco revetments allows to revise these assumptions. No monuments with stuccos have been documented for the Proto Ilkhanid period (0%), indicating that in the formative period of Ilkhanid architecture, patronage of stucco repertoires must have taken place only on a minor scale. Dated Ilkhanid revetments from this period, such as the monumental lustre mihrab from the Islamic Art Museum Berlin dated 1226 (Inv. No. 5366),⁶² are one of the best examples of Ilkhanid architectural revetments, which illustrate that monuments continued to be constructed and decorated in the period which followed the Mongol conquest of the Iranian territory, and that the rupture between the Seljuq and Ilkhanid periods of monument patronage was minimal.⁶³

The collected information also illustrates that nine monuments were constructed or decorated with stucco in the Early Ilkhanid period (1256-1295).⁶⁴ This data indicates that the patronage of Ilkhanid carved stucco began in at least the early Ilkhanid period, although it is likely that earlier Ilkhanid examples also exist, which cannot be precisely dated to the given chronological frame. There had to be a minimum continuity between the Seljuq and Ilkhanid stucco production, for the millenary knowledge of the stucco art to be transferred from generation to generation of craftsmen. Importantly, the few documented examples demonstrate that stucco production proliferation was not explicitly tied to the Golden period of Ilkhanid art and architecture and that the trend of decorating monuments with carved stucco was inherited from the earlier patrons and craftsmen. Patronage and production of stuccos was therefore not related to the state religion of the Empire and it was practiced before Ghazan's conversion to Islam in 1295. These Early Ilkhanid activities of patronage of monument construction and decoration with stucco, should perhaps be understood as pragmatic acts of patronage for the faithful and local population of the Empire's territory. In this manner, the patrons of the monuments and

⁶² [http://www.smb-digital.de/eMuseumPlus?service=direct/1/ResultLightboxView/result.t1.collection_lightbox.\\$TspTitleImageLink.link&sp=10&sp=Scollection&sp=SfieldValue&sp=0&sp=0&sp=3&sp=Slightbox_3x4&sp=0&sp=Sdetail&sp=0&sp=F&sp=T&sp=2](http://www.smb-digital.de/eMuseumPlus?service=direct/1/ResultLightboxView/result.t1.collection_lightbox.$TspTitleImageLink.link&sp=10&sp=Scollection&sp=SfieldValue&sp=0&sp=0&sp=3&sp=Slightbox_3x4&sp=0&sp=Sdetail&sp=0&sp=F&sp=T&sp=2) (Last Accessed: March 3, 2021).

⁶³ Further monuments, which do not comprise carved stuccos, but have been either built or redecorated in the Proto Ilkhanid period comprise: the Imamzada 'Abdullah in Shushtar, foundation of the Pir Husayn Khanqah in Qubalibalaoğlu (Cat. No. 25), the Masjid-i Sang near Darab, the first interventions on the Bayazid Bistami complex in Bistam (Cat. No. 19), and interventions on the Bonafit Friday mosque. From the database of the author.

⁶⁴ These are nine out of a total of twenty-two documented monuments pertaining to this period. From the database of the author.

their revetments asserted their local authority by demonstration of their piousness through the acts of monument patronage.

For the Golden Ilkhanid period (1295-1316) the documentation of monuments illustrates that 44 % (twenty-two) of monuments were decorated with stucco.⁶⁵ This data indicates that only less than a half of monuments was decorated with stucco, which contrasts the assumptions that the majority of architectural activities took place in this period. The research also documents nineteen monuments (38 %) which were decorated with stucco in the Late Ilkhanid period (1316-1335 and alter) marked by the reign of Abu Sa'id and the period of disintegration of the Ilkhanid Empire.⁶⁶ This demonstrates that the patronage of monuments and stucco repertoires did not decline immediately after the end of solid Ilkhanid rule. Quite to the contrary, patrons continued to build and decorate monuments during the period of weakening Ilkhanid power and in the time of fragmentation and disintegration of the Ilkhanid Empire. This is significant and it illustrates that political stability was perhaps not necessary for patronage of monuments. On the other hand, it is likely that patronage of monuments increased, as a result of fragmentation of the Ilkhanid Empire, because the new local rulers aimed to establish and assert their political power through the act of monument patronage. The gathered data therefore provides significant information, which allows us to refine the current understanding of Ilkhanid patronage trends and their chronological context.

1.5 Major Features of Ilkhanid Architecture according to Donald Wilber - Remarks

The discussion of the major characteristics of Ilkhanid architecture by Wilber reflects the somewhat traditional evolutionist view, which is also presented in the *Survey of Persian Art*.⁶⁷ Given that Wilber's monograph is the main publication on the subject of Ilkhanid architecture, it requires a discussion and revision of hypotheses he formulates. Wilber is right in stating that Ilkhanid architecture reflects forms of earlier periods and displays particular features of design and detail,⁶⁸ but he does not state by which types of mechanisms these developments took place. This research illustrates that there was no major break in constructive and decorative activities in the Iranian territory in the period prior to and following the Mongol conquest of the Iranian territory. It demonstrates that the millenary tradition, knowledge and know-how of carved stucco production (and numerous other architectural revetment media) was transferred from the earlier periods into the Ilkhanid times by apprenticeship and experience at construction sites, directly, from person to person, and from generation to generation. Similar applies for the other media of architectural revetments and for monument construction technology and know-how. This however does not signify that architectural structures of the territory developed in an evolutionary manner of direct and logical evolution as proposed by Wilber.⁶⁹ More recent research, for example, the writings of Howard Crane and Korn, illustrate that the period preceding the Ilkhanid dynasty was in fact a time of architectural creativity, new inventions and development of new architectural structure types and forms.⁷⁰ Ilkhanid builders took over this knowledge and architectural forms and developed them further through the trial and error

⁶⁵ In this period a total of 52 (out of c. 120) monuments were either built or redecorated. Accordingly, around one third of the monuments was decorated with carved stuccos, which illustrates the popularity of the decorative medium. From the database of the author.

⁶⁶ In this period, a total of 71 monuments was either built or redecorated. This is considerably more, compared to 52 of the Golden period. From author's database.

⁶⁷ Wilber 1955, 31-34.

⁶⁸ *Ibid.*, 31.

⁶⁹ *Ibid.*, 31.

⁷⁰ See Crane and Korn 2017.

process and via experience at large-scale construction sites, rather than within a framework of a theoretical or political agenda.

Developments of architectural forms during the Ilkhanid period, which mainly concern accentuation of vertical axes of monuments and slightly different structural forms, were therefore works of generations of Ilkhanid builders and they reflect the pushing of the boundaries of architecture. Another particular aspect of Ilkhanid architectural activities concerns frequency of redecoration, repair, and rebuilding interventions on earlier monuments, which were employed as the basic infrastructure of the Empire. Through these activities builders and craftsmen had the opportunity to get well acquainted with older constructive and decorative technologies. They reflected the pragmatic approach of the Ilkhans towards extant monuments and infrastructure, to which new structures were added.

Wilber notes that one does not find a dynamic impulse striving for evolution of architectural style.⁷¹ He explains that the most significant monuments were often built in periods of decline of political and economic power of states, rather than in the periods of their flourishing (such as for example the Sultan Sanjar mausoleum in Marv; 1157).⁷² This research had demonstrated that in fact, the majority of *ex novo* constructions of researched monuments with stuccos, took place in the Late Ilkhanid period and not in the Golden period (see Chapter 1; Section 1.5). But a closer look at the patterns of patronage of Ilkhanid stucco revetments performed in this research (see Chapter 4; Section 4.1) revealed that from the beginning and up to the end of the Ilkhanid dynasty, patterns of patronage also changed. In the Proto and Early Ilkhanid periods less construction activities took place, on the account of the need to repair, modify or redecorate extant monuments, which functioned as the backbone of the Empire's infrastructure. Monument construction took off in the Golden period and became the most frequent in number of constructed monuments in the Late Ilkhanid period. In the Late Ilkhanid period, when the majority of the monuments was built, their patrons were mainly the local authorities, who asserted their political power also through monument patronage. These finds are significant and they revise Wilber's interpretation of Ilkhanid architecture and its chronological context.

According to Wilber, at such high points, elements of architecture and decoration were combined into a temporary unit and the full organic unity (unity of monuments' appearance) was neither established nor carried over into the following period.⁷³ One can propose an understanding alternative to this statement. It is equally possible that the transmission of architectural models, solutions or revetments was strongly conditioned by inventions and pragmatic approach of patrons, builders and craftsmen. Carved stucco was an extremely widespread revetment medium until the end of the Ilkhanid period, but subsequently it slowly gave way to the tile mosaic medium. Similarly, applied moulded and stencilled stucco techniques were invented in the early fourteenth century, but were short-lived and soon substituted by tile mosaic. Tile mosaic technology comprised the possibility of revetment pre-fabrication to a large extent, which reduced the time of monument construction and decoration campaigns. It was more resistant to weathering agents compared to the other revetments. Due to the availability of craftsmen and listed advantages, this medium became extremely popular

⁷¹ Wilber 1955, 31.

⁷² *Ibid.*, 31.

⁷³ *Ibid.*, 31.

in the Aq Quyunlu and Timurid periods, on account of lesser frequency of use of stucco.⁷⁴ This change comprised a significant change of architectural revetments and monuments' aesthetic appearance. It is however unlikely that inventions and changes described could be results of a desire for aesthetic changes. This process took longer, compared to what it seems and it was actually not a sudden change. Tile mosaic is recorded on several monuments in north-western Iran and the Caucasus from the early fourteenth century onwards. It took time for all the technological inventions to be put in place for the craftsmen to produce tile mosaic revetment repertoires as striking as those of the Yazd Friday mosque (completed around 1365).⁷⁵ Similar can be proposed for architectural forms, elements and proportions: they developed based on the pragmatic approach of builders and architects and based on the needs for new solutions.

Wilber proposes that a unified appearance of monuments is not an important feature of Islamic architecture in Iran, but that the monuments have their own highly expressive character and that in architecture the interest in ornamental surfaces was at least equal to concern with structural forms.⁷⁶ It would be more reasonable to consider that all monuments of the Ilkhanid period consisted of architectural structures and pertaining architectural revetment repertoires, which were equally important. This understanding is more challenging to comprehend, due to numerous alterations made to the monuments and their repertoires, but it is well visible in those structures, which were subjected to limited subsequent modifications. Perhaps the best case is the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), where the monumental architectural revetment repertoire in exterior and interior matches the monumental architectural structure, from the point of view of difficulty of its production, dimensions, necessary material and labour. In fact, the effort necessary for the construction of monuments might have been more emphasized by art historians, compared to the necessary knowledge, know-how, labour and resources for revetment production designated as crafts.

According to Wilber, decorative elements are developed in a cycle of experiment, mastery, and decline, similar to western art, but in longer cycles and with frequent archaisms.⁷⁷ Perhaps, rather than seen as throwbacks of decorative devices, these elements could be understood as stemming from the long-standing tradition of arts, such as carved stucco. It has been shown that artistic exchange between different architectural revetment media took place only up to a certain extent, due to technological limitations of every medium and due to the mobility of craftsmen and workshop system, which was not organized under one umbrella institution.

Wilber proposes that the Ilkhanid architectural style derived directly from Seljuq monuments.⁷⁸ While this is partially correct, it is necessary to note that many architectural solutions employed by the Ilkhanid builders and architects pre-date the Seljuq period and that Ilkhanid architecture was based on the building tradition of the Iranian territory and technology and know-how of monument construction and architectural forms taken over from the Seljuq predecessors. Wilber also notes that one of the characteristic traits of the Seljuq and Ilkhanid period was architecture for Shi'ite Islamic rites.⁷⁹ Among these, the most important aspects comprised

⁷⁴ Further new techniques for production of glazed revetments were developed in these periods. Sandra Aube, Ceramic tile decoration in 15th-century Tabriz, paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2020.

⁷⁵ For extensive discussion of Iranian tile mosaics, see Aube 2017.

⁷⁶ Wilber 1955, 31.

⁷⁷ *Ibid.*

⁷⁸ *Ibid.*, 31.

⁷⁹ *Ibid.*, 32.

attention to Sufism and devotion to the Imams and local Muslim elites (Sayyids, etc.). This resulted in increased patronage of Shi'ite sites such as those in Iraq, Qum and Mashhad, construction of *imamzadas* and pilgrimage complexes. It is important to note that the described phenomenon had a limited spread and appeal in Seljuq times and that it came into its full form during the Ilkhanid period, starting with Uljaytu's conversion to the Shi'i Islam in 1309. Another specific aspect of the Ilkhanid period was also that pilgrimage was encouraged and sanctioned by the State (reforms of Ghazan Khan), which is different, compared to the preceding period. This determined some patterns of patronage and development of pilgrimage complexes, which were frequently also revetted in carved stucco. Patronage of these complexes may also reflect the will of patrons and the state to root their authority through endowments to complexes and religious authorities of earlier periods (often native to Iran).

For both the Seljuq and Ilkhanid architecture, religious monuments were greater in number, compared to secular monuments and little is known of palaces or elegant houses, due to them being constructed out of more perishable materials, according to Wilber.⁸⁰ He mentions the significance of survival rate of monuments, caused by their deterioration, due to the construction materials employed, which is partially true. It might be better to consider the concept of preservation rate of monuments; monuments with religious function were preserved, because they were continuously employed by communities and consequently enlarged, repaired and decorated in post-Ilkhanid times. This is significantly different, compared to secular structures which were not employed and preserved by the post-Ilkhanid communities. The religious monuments too would have perished if they were left without maintenance in post-Ilkhanid period.⁸¹ In fact, monuments subject to this study (see the Appendix) show extensive post-Ilkhanid constructive and decorative phases tied to the monuments' functionality and enabling continuation of their functions.

In Wilber's words, architectural design was in an experimental phase during Seljuq period and during Ilkhanid times a major interest in assimilation and recombination of forms of construction and decoration took place.⁸² This view does not give justice to the achievements such as the Isfahan Friday mosque with its two domed halls, numerous other congregational mosques or the Sultan Sanjar mausoleum in Marv. At the same time, designs and architectural solutions of these monuments are not easy to compare to the Uljaytu mausoleum at Sultaniyya. It would thus be more justified to consider each period separately or on the same level, rather than to try to distinguish the two through evolutionary lenses. Such an approach could yield a better understanding of changes of architecture in the given time frame.

But Wilber correctly emphasizes that the Ilkhanid builders took over all the plan forms, construction materials and methods of construction common to Seljuq structures.⁸³ Observations of extant Ilkhanid monuments in fact reveal the use of Seljuq transitional zone solutions and many ground plan forms which were already practiced in Seljuq period. But some monuments seem to be exceptions and could be works of Ilkhanid architects and master

⁸⁰ Wilber 1955, 32.

⁸¹ Two of the rare cases of unaltered Ilkhanid monuments are the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) and the Pir-i Bakran mausoleum (Cat. No. 2) near Isfahan. In both cases, the two monuments fell into disrepair and were in a ruined state until the twentieth century rescue restoration interventions were performed. The vast majority of Ilkhanid monuments which are extant in fact "survived" due to a series of alteration and maintenance interventions on their structures and revetments in the post-Ilkhanid period.

⁸² Wilber 1955, 32.

⁸³ *Ibid.*, 32.

builders, because they present specific solutions, distinct forms and proportions: the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), the 'Ali Shah mausoleum in Tabriz and the no longer extant mausoleum of Ghazan Khan in Ghazaniyya. Especially the Uljaytu mausoleum at Sultaniyya features architectural solutions specific to its design and structural necessities, and should be considered an original product of Ilkhanid architects and master builders.

As distinctively Ilkhanid style of architecture, compared to the Seljuq, Wilber considers the following features: emphasis on verticality and refinement of selected forms and different proportions of architectural spaces (loftier chambers, narrower and higher *iwans*, use of corner colonnettes in larger number, concentration of structural strength of monuments, and more window openings).⁸⁴ Moreover, Seljuq vault forms continued to be employed and the muqarnas became more frequently used.⁸⁵ The Seljuq invention of a trilobed muqarnas covering the corner squinches of transitional zone was transformed and employed differently in the Ilkhanid architecture.

Ilkhanid architecture was cosmopolitan, imperial and provincial, according to Wilber.⁸⁶ Construction on a large scale by royal decree was also put into practice in Ilkhanid Iran in two manners.⁸⁷ On one hand, there were imperial construction projects such as those of Ghazaniyya, Sultaniyya and Rabi-i Rashidi. As elucidated in this research, on the example of the Uljaytu mausoleum (Cat. No. 27), these large scale projects and construction sites functioned as generators of inventions of new construction technologies and especially artistic techniques and know-how of production of architectural revetments. They transformed the artisans, craftsmen and builders involved in the commissions, who gathered new experience and spread it throughout the territory through their subsequent mobility for other commissions of different types and on differing scales.⁸⁸ On the other hand, written sources report concerning reforms of Ghazan Khan, which also determined construction of monuments, such as the decree that in every community of the Ilkhanid realm there should be a mosque and a bath.⁸⁹

Wilber also notes that in terms of architectural style, he could only distinguish regional styles of north-western Iran (referred to as Azerbaijan) and Yazd. It is beyond the feasibility of this research to provide a detailed scrutiny of all the architectural structures of the Ilkhanid period but judging by the monuments focus of this research, it becomes apparent that climatic conditions and material availability as well as availability of builders and craftsmen, greatly determined the features of constructed monuments and their revetments. Nevertheless, due to the long distance (trans-regional) mobility of craftsmen and builders, as elucidated in this research, the differences in architecture of geographical regions are less clear-cut and more blurred, compared to the traditional view of regional builders' and revetments' craftsmen schools, presented by Shani, Hillenbrand and Wilber (see below, Section 4.4).

⁸⁴ Wilber 1955, 33.

⁸⁵ *Ibid.*, 33.

⁸⁶ *Ibid.*, 33.

⁸⁷ *Ibid.*, 34.

⁸⁸ See also Holod 1988, 3.

⁸⁹ Wilber 1955, 34. The decree in question likely prompted further building activities across the territory of the Empire.

Chapter Two: Ilkhanid Architectural Structures – their Builders, Form and Function

Introduction

This chapter provides information concerning Ilkhanid architectural structures, their builders, architectural form and function. It addresses questions regarding identity of personages in charge of monument construction, how the bulk of architectural knowledge formed and how the architectural models were transmitted. The main building techniques, technology and architectural elements, characteristic of the Ilkhanid monuments are discussed. A closer look at monumental structures and their ground plans, and architectural forms of monuments which comprise stucco repertoires is provided. The chapter concludes with an attempt to discern what the characteristics of Ilkhanid architectural style were. These aspects of Ilkhanid architecture are significant because they are closely related to their stucco revetments. Comprehension and understanding of stuccos can help to discern differences between the pre-Ilkhanid and Ilkhanid monuments and their stuccos. This is necessary for the understanding of the Ilkhanid stucco style. This chapter accordingly proposes the context for research of the Ilkhanid stuccos which must be discussed in relation to the monuments where they are located. Monuments presented in this research are not documented in sufficient details and systematically enough, to discern new evidence concerning their construction. Yet, observations of architectural structures allow the proposition of new considerations regarding the Ilkhanid era monument construction and decoration practices.

2.1 Ilkhanid Architecture - Building Knowledge and Construction Technology

a.) Background - Sources for the Understanding of Ilkhanid Architectural Practices

Primary written sources retain only scant information concerning the construction of monuments in Islamic lands. An earlier and very significant source regarding Islamic architecture is the *Book of Creation and of History* written in 965-66, by Mutahhir ibn-i Tahir al-Maqdisi; one chapter of this work concerns the argument for the existence of God, in which the creation of the universe is compared to the construction of a building.⁹⁰ This work describes the monument construction with an unusual precision and can be comprehended as indicative of knowledge of the building practices of its era, perhaps for the regions of historic Khurasan and Transoxiana. In his writing, the author distinguishes between different phases of monument construction: preparation of mud bricks, moulding of mud bricks, laying of foundations and building of walls, preparations of parts of the superstructure, the assembling of the ceiling, roofing and setting of doors and finishes.⁹¹ The *Book of the Things that Writers and Secretaries Need to Know about Arithmetic* by Abu al-Wafa' al-Buzajani (940-998), a theoretical mathematician, is the manual on the necessary knowledge of geometry for craftsmen; this work indicates the existence of written works for craftsmen.⁹² It is a practical book, which offers hands-on information on geometry, which is explained in a comprehensive manner.

From the Ilkhanid period, one of the most important finds comprises the incised plan of a muqarnas vault which was discovered at the site of Takht-i Sulayman (see below). Primary written sources retain evidence of the existence of an Ilkhanid treatise concerning the construction of monuments written by Rashid al-Din in the late thirteenth century, titled *The Book of Living Things (Animals) and Monuments*, but this work did not survive to the present

⁹⁰ Holod and Grabar 1979-80, 312-319.

⁹¹ See *Ibid.*, 315-319.

⁹² Holod 1988, 3.

times.⁹³ Nevertheless, the fact that the work existed indicates the interest of the dynasty and perhaps its ruler(s) in monument construction. From the Timurid period, a work which concerns application of mathematics to practical architecture, was written around 1423 by Ghiyas al-Din Kashi.⁹⁴ The treatise provides instructions regarding measurement and computation of arch surfaces, domes and muqarnas and it illustrates the importance of Timurid architecture design's theoretical background, which was based on the modular system.⁹⁵ On rare occasions, mainly from the Timurid period and later dynasties, some plans and drawings of revetments and monument plans have been preserved. Among these, the Topkapı Scroll and the drawings by the Bukhara master, present the most significant evidence regarding the revetment design and monument ground plan drawing practices.

b.) Architects and Master Builders

Sources providing information about architects in the Islamic realm and in Ilkhanid Iran are scarce, compared to the relative abundance of sources for medieval Europe.⁹⁶ One of the most extensive works on the subject is presented by Mayer, who compiled an account of some 330 names of architects in the Islamic lands, which occur over a period of a millennium.⁹⁷ Nevertheless, little is known about these architects, apart from their names and the monuments they were connected with, due to the main source of information consisting of signatures on monuments. This research resulted in locating some four signatures of architects pertaining to the Ilkhanid monuments (see below).⁹⁸ Among these, double signatures, such as the ones on the Pir Husayn Khanqah in Qubalıbalaoğlan (Cat. No. 25) and the ones at the 'Ali ibn-i Ma'ali mausoleum in Qum (Cat. No. 15), are the most informative of work division and different professions involved into monument construction (for detailed discussion, see Chapter 4; Section 4.2).

John Harvey distinguishes two terms: *architecture* and *building*.⁹⁹ He suggests that *building* and any of the crafts related to it (for example, carpentry, masonry) is a technical skill, which is acquired and passed on; it is a method which comprises the *already known* by which practical issues can be resolved. *Architecture* is, quite differently, the knowledge of solving a problem, which involves the creation (invention) of a new solution to the presented challenge, which results in a creative design with a particular purpose or programme.¹⁰⁰ The Ilkhanid monuments examined in this research are easy to divide into these two categories; some are repetitions of existing structures and others were built with new architectural solutions.¹⁰¹ The listed distinction was however not necessarily recognized in Ilkhanid times, but it is relevant when interpreting monuments and signatures of architects, builders and craftsmen.

⁹³ The surviving table of contents of this work indicates that it contained a series of rules to be followed in houses, religious buildings and fortress construction, and information concerning the construction of tombs. Lewcock 1984, 133; Wilber 1955, 42; Holod and Grabar 1979-80, 310.

⁹⁴ Lewcock 1984, 133. For a detailed study, see Dold-Samplonius 1992.

⁹⁵ Holod and Grabar 1979-80, 311.

⁹⁶ Mayer 1956, 29. For further literature on the subject of Medieval architects and master builders, see Binding 2010, 27-76; Binding and Nussbaum 1978, 43-45.

⁹⁷ Mayer 1956.

⁹⁸ Out of these four signatures, two are already noted by Mayer and the other two were documented on monuments during the field campaigns.

⁹⁹ Harvey 1972, 17-18.

¹⁰⁰ *Ibid.*

¹⁰¹ Similar is reflected in the difference between the master builder, who could head a construction of a monument based on his knowledge he acquired through the experience of monument construction, and the architect, who designed monuments of innovative forms with specific architectural solutions.

Throughout history, the main occupation of the architect was to design monuments in accordance to their building material and for them to determine a durable structure.¹⁰² The role of the architect who designed the building was also to participate on the construction site and to direct builders to the correct construction of the monument.¹⁰³ If so, the role of the overseer was more focused on administrative manners of monument construction than technical work. Harvey states that:

“drawing of some kind is always essential to the production of architecture on a large scale, but relatively simple designs can be set out on the ground, and the details drawn out to their full size on a table or a board. The visualization of the result depended primarily on the mental capacity of the architect, aided by rough sketches, not even to scale, which he might trace out with a stick on the ground.”¹⁰⁴

Practices described by Harvey can be employed for comprehension of the Ilkhanid architecture and building design transfer. This is, for example, reflected in the scant evidence provided by the Takht-i Sulayman muqarnas design slab.

It is also necessary to distinguish between the influence on the programme (of a building) and its artistic design.¹⁰⁵ For Ilkhanid architecture, this means the need to distinguish the influence of patrons on monument designs and the actual work of producing the designs by architects. Further determining factors could comprise the religion and the change of the Ilkhanid rulers' creed which occurred several times. Essential conditions, which had to be fulfilled by every religious monument, determined the design and architectural form of Ilkhanid monuments to a certain extent, but the overall design of the monument and its aesthetic characteristics could be determined by the architect and the craftsmen by drawing on the (local) building tradition.

Perhaps the best description of the architect's knowledge would be as a trained person with technical knowledge of engineering and geometry.¹⁰⁶ The profession of the Islamic architect has also been equated with that of the Medieval *geometricus*, the person in charge of measuring the land prior to the beginning of construction activities.¹⁰⁷ There is a comparably larger amount of information concerning the craftsmen in charge of building and decorating the monuments, compared to architects and their role in design of architectural structures.¹⁰⁸ Ronald Lewcock proposes that architects of the Islamic world were individuals who varied from highly trained experts capable of producing new designs of structures and innovations, to successful craftsmen with acquired practical knowledge transformed into architects.¹⁰⁹ Islamic architects, with a few exceptions of distinguished men who practiced architecture, for example mathematician and astrolabist Alam al-Din Qaysar and geometrician Maslama ibn 'Abdullah, the architects had little theoretical training.¹¹⁰ According to Mayer, architects of the Islamic lands had no

¹⁰² Harvey 1972, 18.

¹⁰³ *Ibid.*

¹⁰⁴ *Ibid.*, 35.

¹⁰⁵ *Ibid.*, 27.

¹⁰⁶ Shatzmiller 1994, 212.

¹⁰⁷ See Kostof 1977, 80.

¹⁰⁸ Lewcock 1984, 129.

¹⁰⁹ *Ibid.*, 129.

¹¹⁰ Kostof 1977, 64-65; Mayer 1956, 87; Holod 1988, 2-3.

theoretical training and the difference between the architect and the master mason¹¹¹ was, if it existed, very small.¹¹²

But the profession of the architect was the most skilled and sophisticated among the professions involved in monument construction.¹¹³ This seems plausible and it could have been reflected in the difference of signatures, which comprise appellatives of professions such as *mi'mar* (architect) and *banna'* (mason, builder or master builder). Some evidence concerning the difference between these two titles is provided by the signature of the Diyarbakir walls construction dated 1236-37, which are signed as *building work of Abu al-Faraj al-banna'*, who might have lead their construction by presumably following the *plans or designs (tarsim)* by *Ja'far ibn Ibrahim al-Halabi*.¹¹⁴ The possible difference between the person who might have drawn the plan and perhaps supervised the monument construction and the person who was in charge of monument construction could have been also practiced for construction of Ilkhanid monuments. If so, Ilkhanid architect should be considered as a person who was *the architect as a master builder*.¹¹⁵ The *architect as a master builder*, could originate from the ranks of construction sector, such as building crafts, carpentry or working of construction material, and took part in the process of monument construction together with builders and craftsmen.¹¹⁶ In medieval Europe, a new image of an *architect-designer*, as opposed to *architect-master mason*, emerged by the thirteenth century.¹¹⁷

Mayer notes that use of general terms for signatures of architect's work, such as *ustad* (in Persia, Iraq and Asia Minor and Northern Syria), *mu'allim* (in Western Asia, Egypt and North Africa) and *sahib* (in Algeria),¹¹⁸ for a qualified builder, a foreman, and occasional master of different crafts, indicate the low level of specialization and work division in monument building.¹¹⁹ These titles have not been documented on Ilkhanid stuccos presented in this research or on historic inscriptions of their monuments. According to Spiro Kostof, the terms *mi'mar*, *banna'* and *muhandis*¹²⁰ were different terms, which were employed to designate works of architects, but, as indicated below, it would be better to consider *banna'* as a title of a master builder.¹²¹ These three expressions have all been documented as frequently employed on the Ilkhanid

¹¹¹ The term mason is of unclear origin and it changed its meaning through time; it became associated with French *maisonner* (to build, make a house), implying that mason was a person who was the builder and was responsible for design and construction of monuments, similar to the modern comprehension of the term architect. Slightly later, the term *mason* was juxtaposed to carpenter (builder in timber), although a mason could be expert builder in both, stone and wood, later the two expressions were further separated by the specialized delimitation of professions by the craft-guilds. Harvey 1973, 12.

¹¹² Mayer 1956, 19.

¹¹³ Shatzmiller 1994, 211. According to Korn, it is not clear who had the role of the supervisor and to which constructive undertaking does the inscription exactly refer; most likely to construction of two towers of the city wall. See Korn 2004, Vol 2, 292.

¹¹⁴ For the entire inscription and the two signatures, see TEI 2589 (Last Accessed: December 11, 2021); Mayer 1956, 37-38. Four such inscriptions naming the same designer have been documented. Wilber 1955, 42.

¹¹⁵ As opposed to the antique notion of architect as a planner. See Kostof 1977, 60, 71.

¹¹⁶ Kostof 1977, 61.

¹¹⁷ Kostof 1977, 76; Harvey 1973, 30-31.

¹¹⁸ Mayer 1956, 27.

¹¹⁹ Mayer 1956, 24, 27. See also Shatzmiller 1994, 213.

¹²⁰ For the discussion of the meaning of the term *muhandis*, see also Bier 2016, 65-67.

¹²¹ Kostof suggests that there exists no clear distinction between these terms, although this research had shown it, based on double signatures. Kostof also proposes, similar to Mayer, that the term *mi'mar* was of the lowest rank. This contradicts the evidence of signatures of architects from Ilkhanid Iran, where *mi'mar* seems to be superior to *banna'* or *muhandis*. Kostof 1977, 65. Mayer suggests that the three expressions were among themselves not synonymous. Mayer 1956, 25-26.

architectural revetments and carved stuccos. Lewcock suggests that signatures of architects do not appear on monuments frequently, due to the fashions of different chronological and geographical contexts.¹²²

A reference exists in the writings of Rashid al-Din on the construction of Ghazan Khan's mausoleum, by master builders (*ustadan banna*) and engineers (*muhandisan*).¹²³ This evidence indicates that there in fact existed a distinction between the profession of a master builder (*ustad banna*) and the engineer or architect (*muhandis*). Moreover, the use of plural in the primary source indicates that more than one person was employed to lead the construction of the monumental complex. It thus provides evidence of shared projects and plurality of experts on Ilkhanid construction sites. According to Wilber, the terms which denote architect (*mi'mar* or *muhandis mi'mar*) have not been found on the monuments which he debates in his monograph.¹²⁴ The term *mi'mar* was however found on monuments presented in this research (see Chapter 4; Section 4.2). Moreover, Wilber informs that *mi'mar* was being employed in Asia Minor and India since the thirteenth century.¹²⁵ It is likely that architects were also active in the Ilkhanid Iran and that these individuals had to be of a higher social and economic status, compared to builders and craftsmen of whom the signatures have been documented.¹²⁶

c.) Patrons and Overseers

Historic inscriptions denoting patrons¹²⁷ of the majority of Islamic and Ilkhanid monuments begin with the verb *he ordered* (*amara*). Only in exceptional cases, such as perhaps the example of Ghazan Khan's involvement into the process of designing of his mausoleum at Ghazaniyya (according to Rashid al-Din, Ghazan himself drew the plans for his tomb),¹²⁸ did the patron's role in monument design extend beyond sponsorship of a monument.¹²⁹ The account by Rashid al-Din is also important because it confirms that at least for monuments of imperial significance, plans were prepared prior to their construction.¹³⁰ It is plausible that there exist fewer mentions of architects in historic inscriptions,¹³¹ due to them being overshadowed by the emphasis on patrons of the monuments.¹³² Primary written sources from the fifteenth century, regarding the late thirteenth century Mamluk Cairo, provide direct evidence of the patron being involved into the summoning of architects and choice of overseers for construction sites of monuments.¹³³ The patron would also facilitate acquisition of the necessary material and labour for the

¹²² Lewcock 1984, 131.

¹²³ Wilber 1955, 47.

¹²⁴ *Ibid.*, 47.

¹²⁵ *Ibid.*, 47.

¹²⁶ *Ibid.*, 47.

¹²⁷ Aspects of Islamic architecture patronage are rarely addressed as independent subjects of publications. Some good examples are works by Bruno De Nicola, Crane and Steven Humphreys. See De Nicola 2020; Crane 1993; Humphreys 1994.

¹²⁸ Wilber 1955, 42.

¹²⁹ This phenomenon is similar to the situation in medieval Europe. In European historic sources patrons of monuments are denoted with verbs such as *fecit*, *construxit* and *aedificavit*, although their role rarely extended beyond the act of ordering and sponsorship of a monument. Kostof 1977, 60.

¹³⁰ Wilber 1955, 42.

¹³¹ For information on structuring of historic inscriptions, see Gaube 1982, 213-215.

¹³² Signatures of architects and craftsmen would be placed at the ends of historic inscriptions (patrons' identities would be placed in their initial parts). If there was no space for architects' and craftsmen' signatures they would be omitted. It remains unclear who took these decisions.

¹³³ Lewcock 1984, 129. There are similar examples of close collaboration between patrons and architect in 13-16th century Europe. See Kostof 1977, 80-81. The choice of overseers was performed by patrons also in medieval Europe. Kostof 1977, 83.

construction of the monument.¹³⁴ Another significant difference between Western medieval monuments construction undertakings and those in the Islamic world was the wealth of patrons, who could provide sufficient amount of funding, material and labour for the monument construction to take place rapidly and within the career of one architect.¹³⁵ Differently from European medieval religious monuments (for example, cathedrals), Islamic monuments of extensive dimensions were often conceived, planned and completed by the same master.¹³⁶

Similarly to the role of architects, the overseers of constructive and decorative interventions (or superintendents or supervisors) likely varied from somebody who functioned as a clerk of works and other persons who were the superintendents or architects-engineers.¹³⁷ This was the role of the administrative official, and in Mamluk Egypt the overseer was selected from the military class members, but in Islamic Spain from among civilians; in both cases the person was a government servant with temporary duties of a contractor and business manager and the person could have acquired some technical knowledge by involvement into different construction projects.¹³⁸ The work of the overseer was often preceded by the verb *'ala yaday* (by the hands of), but this verb has not been encountered in the historic inscriptions of Ilkhanid monuments presented in this research. Two such cases have however been documented on Seljuq monuments.¹³⁹ Historic inscriptions on Ilkhanid monuments occasionally mention overseers of monuments or stucco revetment repertoires and they are discussed in detail in the discussion dedicated to the monument patronage (see Chapter 4; Section 4.2).

d.) Construction Site Work Division

Labour division and specialization in the construction sector existed on two levels: manufacturing of construction material and the activities of building construction.¹⁴⁰ The employed raw materials and the manners of their processing determined the related professions. Some of the most common professions were: makers of fired bricks (*ajurri*), cutters of fired bricks (*qatta 'i ajurr*), makers of adobe bricks (*tawabaki*), workers of marble (*rakhkham*), workers of clay or plaster (*tayyan*), stone workers (*hajjar*), sand workers (*rammal*) and plaster workers (*jassas*).¹⁴¹ While the listed information on building material working is informative of labour division related to the construction sector, not all of these professions are attested for the Iranian territory and neither for the Ilkhanid period. It is however plausible that similar to the other lands of Islam, related professions also existed in the Iranian territory.

It has been noted that craftsmen's signatures are more frequent on Ilkhanid architectural revetments compared to signatures of architects and master builders. The research of signatures on stucco and other architectural revetment media indicates that already during the Ilkhanid period there existed different professional appellatives for craftsmen involved into monument construction and that they were thus divided into separate crafts: mason (*banna*; dealing with building works), carpenter (*najjar*; working with wood), tile or tile cutter (*kashi tarash*, *qatta* ,

¹³⁴ Lewcock 1984, 129.

¹³⁵ Lewcock 1984, 131; Kostof 1977, 66; Mayer 1956, 23.

¹³⁶ Mayer 1956, 23.

¹³⁷ Lewcock 1984, 130. Compare to Monneret de Villard 1968, 303.

¹³⁸ Mayer 1956, 19.

¹³⁹ They were employed for inscriptions at the Friday mosque of Isfahan (see TEI 6687, Last Accessed: December 14, 2021) and at the Ardistan Friday mosque (see TEI 7939, Last Accessed: December 14, 2021). See also Blair 1992, 160; Godard 1936, 290.

¹⁴⁰ Shatzmiller 1994, 209.

¹⁴¹ *Ibid.*, 209-210.

producing revetments involving glazed elements), plaster worker (*jassas*) and bricklayer (*ajjurri*, working with bricks).¹⁴² This is comparable to the division of professions involved in monument construction in medieval Europe.¹⁴³ Mayer notes that signatures of architects in inscriptions on the monuments are occasionally preceded by the verb *sun* 'at (work of), but that *'amal* (work of) is more frequently employed.¹⁴⁴ For architects' signatures on Ilkhanid monuments presented in this study (four cases in total), only the verb *'amal* has been documented. Wilber notes that craftsmen's signatures occur more frequently, compared to those of architects, due to the fact that it was the craftsmen who produced the revetments and not the architects, and they could thus take the liberty of signing their works.¹⁴⁵ Mayer suggests that there exist primary sources indicating that it was an honour to have one's name mentioned in historic inscriptions, which was granted by a sovereign or the patron.¹⁴⁶

Mayer notes that differently to potters or other craftsmen, there exist no written sources informing about long-distance mass mobilization (which could be forced) of stone masons or architects and that thus each case needs to be examined individually.¹⁴⁷ There exists no information on whether the Ilkhanids employed forced labour for construction of monuments.¹⁴⁸ The longest known mobility-distance for a medieval European architect in 1287 was from Alsace to Transylvania, which exceeded the 1,930 km distance.¹⁴⁹ For the Ilkhanid Empire the distances of mobility of architects remain unknown, due to the lack of evidence. It is reasonable to assume that for significant commissions architects could be mobilized long-distance, similar to craftsmen, for whom there is a considerable evidence of moving long and short distances (see Chapter 4; Section 4.4),.

Kostof proposes that the profession of an architect pertained to the lower strata of the society of Islamic lands, and that architects were considered part of the servant class.¹⁵⁰ This is reflected in scarce information on architects' salaries which were comparable to those of masons of marble and lower than salaries of mosque gatekeepers.¹⁵¹ On occasions, for example in Mamluk Cairo, architects were gifted robes of honour upon the successful completion of projects.¹⁵² But Chardin reports that for completion of royal buildings, the architect earned 20 % of the cost of construction.¹⁵³ If so, this was a very respectful salary. It however remains unclear if this was the case in Ilkhanid Iran; there exists no evidence concerning expenses for monument construction and salaries of personages involved in their construction and decoration for this period.

For the choice of architects for monument commissions, two possibilities exist: patrons could have chosen and appointed architects for their commissions, or the architects could have been

¹⁴² From the author's research of signatures on different media of Ilkhanid architectural revetments. Author's monument database.

¹⁴³ Harvey 1973, 13. For information concerning such practices in the Indian subcontinent and the Far East, see Prak 2011.

¹⁴⁴ Mayer 1956, 25.

¹⁴⁵ See Wilber 1978.

¹⁴⁶ Mayer 1956, 21.

¹⁴⁷ Mayer 1956, 28; Harvey 1973, 20.

¹⁴⁸ Such practice is however well documented for earlier chronological contexts and diverse geographical units. Monneret de Villard 1968, 308.

¹⁴⁹ Harvey 1972, 37. See also Harvey 1972, 154-155; Harvey 1973, 50.

¹⁵⁰ Kostof 1977, 65.

¹⁵¹ Mayer 1956, 25; Kostof 1977, 65.

¹⁵² Mayer 1956, 26.

¹⁵³ Ferrier 1996, 171.

chosen by committees of Ilkhanid officials and representatives of communities. Observations of the Ilkhanid monuments did not reveal any evidence of a patron employing the same experts for different monuments. In fact, there are very few cases of monuments being sponsored by the same person, and if so, these monuments retain different functions and architectural structures. The choice may have been impacted by local availability of craftsmen, such as in the case of the monuments in Bistam (Cat. Nos. 18, 19), sponsored also by Ghazan Khan and Uljaytu, where a local stucco craftsmen's workshop was employed. It is unclear how the Ilkhanid architects were trained and whether they possessed a basic formal education or if their knowledge and know-how stemmed from apprenticeship only.¹⁵⁴ Judging by the evidence of extant Ilkhanid monuments, the latter seems to have been a more frequent practice. This research illustrates that in many cases, especially for the Ilkhanid funerary structures, the basic plans, designs and schemes repeat with minimal variations.¹⁵⁵ But for exceptional structures, such as the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), the person responsible for their design needed to possess sound knowledge of geometry, mathematics, applied mechanics and drawing.¹⁵⁶ The monument scale is very significant, because the monument's dimensions required a high degree of constructional organization.¹⁵⁷

e.) Building Knowledge, Skills and Apprenticeship

Architects of European and Islamic lands, around the twelfth century, rediscovered and studied Euclidean geometry.¹⁵⁸ This resulted in architecture which was an exercise of solid geometry of space and proportional arrangement of its parts.¹⁵⁹ The process and the necessary knowledge of designing a monument and its construction according to the planned design transcended the work of artisans and required supervision by a professional.¹⁶⁰ It was of essential significance for the practicing architect to be capable of drawing, use a ruler, square and compass and although reading was not necessary, this does not mean that all architects could not read.¹⁶¹ Similar tools were used by stone masons and craftsmen of architectural revetments.¹⁶² Builders also employed levels and the plumb-bob.¹⁶³ From the thirteenth century onwards, in Europe, a large number of architects were literate.¹⁶⁴ Nevertheless, the essential education of architects was the knowledge of the methods of planning and design, and skills of masonry and carpentry,

¹⁵⁴ It is unlikely that apprenticeship of architects in Ilkhanid Iran was as structured as that of the Gothic European architects. Apprenticeships of these architects lasted 7 years and were followed by 3 years of improvement as a journeyman (a hired man who works for a daily rate of pay). Their training concluded with presentation of a masterwork (a model demonstrating skills of a master or a successfully completed project). Kostof 1977, 80; Harvey 1972, 90-92; Harvey 1973, 43. See also Binding 2010, 64-76.

¹⁵⁵ Use of related architectural solutions (ground plans, elevations and transitional zones), is well visible through comparison of monuments in the area between Abarquh, Yazd and Na'in. Compare for example the mausolea of Abarquh (Cat. No. 10) with the mausolea of funerary complexes in Yazd (Cat. No. 29) and the mausoleum of the Baba 'Abdullah complex in Na'in (Cat. No. 11). All these structures present closely related architectural solutions.

¹⁵⁶ See also Lewcock 1984, 130. Kostof notes that the architect of the Sultaniyya mausoleum had to possess advanced knowledge and skills, which could have however been acquired in an entirely empirical manner, and above all consisted of experience of construction. Kostof 1977, 65.

¹⁵⁷ Harvey 1973, 10.

¹⁵⁸ Harvey 1972, 49, 94-95, 97; Harvey 1973, 43. For the most recent discussion of the subject, see Necipoğlu 2017.

¹⁵⁹ Harvey 1972, 49. For further information concerning medieval European architecture construction and proportion, see Binding 2015.

¹⁶⁰ Harvey 1972, 49. See also and compare to Binding 2010, 64-76.

¹⁶¹ Harvey 1972, 87.

¹⁶² *Ibid.*, 127.

¹⁶³ *Ibid.*, 127.

¹⁶⁴ *Ibid.*, 88.

or both crafts.¹⁶⁵ This would consist of basic knowledge of arithmetic and experience in mensuration for the control of the payments.¹⁶⁶ Prior to 1300, European masons and carpenters acquired skills of planning, proportions and other details within family circles.¹⁶⁷ The difference between the architect and master mason or carpenter was the practical knowledge of geometry possessed by the architect.¹⁶⁸ In addition to drawing and designing the plan of the monument, other tasks of the architect were those of surveying the terrain and setting out the monument plan.¹⁶⁹

European medieval architects did not need to possess *higher education*, such as academic learning, because they obtained their knowledge by different channels, such as the corpus of traditional geometrical methods, which were handed down to them as a practical knowledge.¹⁷⁰ Similar should be assumed for the Ilkhanid architects and especially master builders, who must have been in charge of monumental commissions, which required advanced knowledge of monument planning and construction. Writings of Ibn Khaldun (1332-1406), indicate that knowledge of geometry was employed for architectural designs, for proportions and measurements, which enabled the production of monument plans and structures.¹⁷¹ Research by Bulatov indicates that the most commonly employed proportion was 1:2 and that proportions and ratios for Islamic monuments were derived from the perfect square.¹⁷² Kostof explains that construction material was more costly, compared to the labour force and that one of the talents searched for in the architect, was the capability of conservation of resources and among these especially in minimizing the use of timber for scaffolding.¹⁷³ This may apply to Islamic architects and those of the Ilkhanid period. Important evidence is provided by observations of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27). Its structure includes a number of galleries, staircases and passages, which substituted and reduced to a minimum the need for wooden scaffolding. These passages could also be employed for the maintenance of the monument upon its completion. Similar attitude in constructing monuments is observed on structures of more limited dimensions, where parts of their interior and exterior structure enabled the builders to move around during their construction and for their maintenance.¹⁷⁴

In Europe, the system of apprenticeship began around the thirteenth century and provided an alternative way of learning and becoming a craftsman.¹⁷⁵ Apprenticeships evolved into a means of providing education in craft skills, through a legal contract between master craftsmen and apprentices,¹⁷⁶ but such structured programmes have not been documented for the Islamic lands. Evidence from Fatimid and Ayyubid period Cairo indicates that around 265 different crafts existed in the city.¹⁷⁷ Division of work by specialization into different crafts reduced the

¹⁶⁵ Harvey 1972, 89.

¹⁶⁶ *Ibid.*, 90.

¹⁶⁷ *Ibid.*, 90. For further information concerning mobility an apprenticeship and professionalization of professions tied to construction of European medieval monuments, see Binding 2005.

¹⁶⁸ Harvey 1972, 93. Harvey also provides an account of education and career of European medieval architects. See Harvey 1972, 99-100.

¹⁶⁹ *Ibid.*, 107.

¹⁷⁰ *Ibid.*, 114.

¹⁷¹ Lewcock 1984, 132.

¹⁷² Lewcock 1984, 132; Bulatov 1987, especially 234-246.

¹⁷³ Kostof 1977, 81, 91. Compare to Binding and Nussbaum 1978, 58-61.

¹⁷⁴ Harvey 1972, 90.

¹⁷⁵ *Ibid.*, 90.

¹⁷⁶ Harvey 1972, 70-71, 90-91, 137-150; Harvey 1973, 48.

¹⁷⁷ Lewcock 1984, 133.

technical knowledge which the craftsmen had to possess, and it allowed the craftsmen to focus their training on one type of work and for it to reach advanced levels.¹⁷⁸

In his description of industry and commerce in Safavid Iran, Chardin states (drawing on the example of Isfahan) that craftsmen were organized into guilds, that each profession had their own chief, from among the members of the guild, but appointed by the ruler.¹⁷⁹ But these guilds assembled rarely, if at all, and they did not have guards or inspectors, but some customs for which the head of the guilds gave assurance were obeyed.¹⁸⁰ The head of the guild apparently did not pay attention to the origin of craftsmen, from whom they learnt the craft and what their level of competence was.¹⁸¹ Craftsmen in Islamic lands were not organized into guilds structures as were those in medieval Europe. There exists however some evidence of connection between craftsmen's workshops and mystical Islamic brotherhoods in the twelfth century Iran, Iraq, Egypt and Turkey.¹⁸² According to Lewcock, craftsmen were loosely affiliated, with a restricted number of the most respected members of craftsmen's community.¹⁸³ Training and organization of craftsmen was structured according to a fixed practice.¹⁸⁴ Craftsmen's roles were occasionally divided into the master of crafts, the pupil or apprentice and unskilled assistant or labourer.¹⁸⁵

According to Chardin, there did not exist any apprenticeship engagements and nothing was paid for learning the trade; the apprentice would be given a salary based on the deal between the master craftsman and the apprentice; it would increase with the passing of years and development of the apprentice's skills.¹⁸⁶ These agreements were not binding and neither signed; the master could dismiss the apprentice and the apprentice could leave the master.¹⁸⁷ It is unlikely that this was different in pre-Safavid periods, Ilkhanid included. The described guild system is different and considerably looser, compared to medieval guild orders in Europe. It is however not clear when the system emerged in the Iranian territory and if it already existed during Ilkhanid times. This research managed to provide sufficient evidence to suggest that during Ilkhanid times, the majority of crafts related to the production of architectural revetments were organized into workshops, which were headed by master craftsmen (see Chapter 5; Section 5.4). It is probable that in the monument construction sector, similar workshops of builders existed and that they were headed by master builders or master masons.

In medieval Europe, there existed a tripartite division of the craftsmen's workshop structure into apprentices, journeymen and masters.¹⁸⁸ In Ilkhanid Iran, stucco masters signed many of their works and there is some indication that the expression *shagird* (apprentice) was used for apprentices in Islamic lands from the Timurid period onward, but not in Ilkhanid Iran. Moreover, no evidence for journeymen exists; although it is likely that they would also participate in workshops of carved stuccos, other revetments and monument construction, they did not sign their works, because this must have been the prerogative of the head of the

¹⁷⁸ Lewcock states that in Cairo, there existed at least five separate crafts connected to woodworking. *Ibid.*, 133.

¹⁷⁹ Ferrier 1996, 167.

¹⁸⁰ *Ibid.*, 167.

¹⁸¹ *Ibid.*, 167.

¹⁸² Lewcock 1984, 133.

¹⁸³ *Ibid.*

¹⁸⁴ *Ibid.*

¹⁸⁵ *Ibid.*

¹⁸⁶ Ferrier 1996, 167.

¹⁸⁷ *Ibid.*, 167.

¹⁸⁸ Harvey 1972, 92.

workshop. Ilkhanid stucco signatures belonged to the master stucco craftsmen, but many stucco repertoires of Seljuq and Ilkhanid period reveal works of more than one craftsman, which can be discerned based on the disparity of skill in stucco revetment production.¹⁸⁹

As suggested in this research, stucco craftsmen's workshops operated independently and they were mobile according to commissions for stuccoworks, on a long and short distance.¹⁹⁰ It was shown that different workshops did not exist according to the status of commission and its patron (imperial vs more modest), but that the same workshops worked on smaller and more extensive projects, as determined by the available endowments. Lewcock proposes that the majority of craftsmen were unlikely to be able to write cursive scripts, which limited them to their profession.¹⁹¹ The research of Ilkhanid stuccos, especially of the modality of production of their design, indicates that they must have been literate and contrasts Lewcock's assumption. It remains unclear whether Ilkhanid stucco craft was subject to any state regulations, which could concern standard rates of pay, standards of workmanship and quality of material and final products. Lewcock mentions that the absence of guilds organization enabled a relative freedom in occupation of sectors of crafts also by non-Muslims, but that as a rule the crafts related to building were in hands of local Muslim craftsmen.¹⁹² Judging from signatures of Ilkhanid master stucco craftsmen (especially their *nisbas*), they seem to be native to the territory of the Ilkhanid Empire. In one pre-Ilkhanid case, the *nisba* indicates a possible provenance of the master stucco craftsman from Iraq.¹⁹³ Further evidence of craftsmen's mobility from the Iranian territory to Fatimid Cairo is provided by Korn.¹⁹⁴ While the proposed hypothesis regarding the provenance of craftsmen might be correct, the architects might have travelled longer distances, due to their expert knowledge. If so, the ethnic background of architects and experts of monument construction could have been more varied, compared to craftsmen's workshops.

f.) Expenditure on Monuments, Building Regulations and Quality Control

Written sources reflect the fact that the imperial commissions of large dimension monuments were extremely costly and that they required many resources, but the actual figures might be exaggerations.¹⁹⁵ Chardin reports that a third of the total of expenses for construction was spent on fired bricks, a third on plaster and another third on woodwork.¹⁹⁶ Little is known regarding building regulations and arbitration during the Ilkhanid period. It is not clear if expropriation of land was practiced for larger-scale monuments. In the Iranian territory there existed a set of regulations concerning construction, maintenance of water supply system and water distribution in the settlements. In some Islamic lands, a *muhtasib* (overseer of markets) retained the role of the clerk of works by supervising building construction; wooden templates for tiles, fired and adobe bricks were kept in a mosque, for builders to produce building material of standardized size and quality.¹⁹⁷ It is plausible that some kind of building sector quality control was put in

¹⁸⁹ For example, the third decorative stage of stuccos (1312-13) at the Pir-i Bakran mausoleum (Cat. No. 2), especially those in the pointed-arch window openings of the mausoleum's third storey. Or the stuccos on the supporting wall surfaces of the interior of the octagonal tomb tower forming the Imamzada 'Abdullah at Gudzar.

¹⁹⁰ Also according to Lewcock, the workshops operated independently and in partnership with other workshops for extensive dimension commissions. Lewcock 1984, 133.

¹⁹¹ Lewcock 1984, 133.

¹⁹² *Ibid.*, 134.

¹⁹³ At the Pir-i Hamza Sabzpush mausoleum in Abarquh. See Karimy and Holakooei 2015.

¹⁹⁴ See Korn 2003.

¹⁹⁵ Lewcock 1984, 132-133.

¹⁹⁶ Ferrier 1996, 171.

¹⁹⁷ Al-Hasan and Hill 1986, 76.

place in parallel to Ghazan Khan's reforms which might have been noted in the lost writings of Rashid al-Din.

g.) Architectural Drawings and Design Techniques

Primary written sources concerning the construction of the Ibn Tulun mosque (876-79) in Cairo, indicate that its plan and design were drawn on parchment prior to its construction.¹⁹⁸ This is not dissimilar to the preserved copy of a plan of the St. Gallen monastery (dated c. 820), which was drawn on five separate sheets of parchment and which presents the programmatic layout of the complex.¹⁹⁹ Both accounts indicate the possibility of monument plans being drawn on parchment in the first centuries of Islam. The arrival of paper technology was therefore not necessary for monument planning but could have aided it and bolstered the practice. Primary written sources from the fifteenth century concerning the late thirteenth century Mamluk Cairo, indicate that the plans for monuments were drawn in the phase of monument design preparations.²⁰⁰ Mentions in written sources of the use of small models of structures, prior to their construction activities, are found in works from 'Abbasid Baghdad, and for construction of the Taj Mahal in Agra.²⁰¹ In some cases in the Islamic world, there reportedly existed a practice of chopping off the hands of the architects upon the completion of masterpieces of architecture, for them not to replicate the works elsewhere; this might indicate that architects of the Islamic realm in fact prepared drawings for monuments (with their own hands).²⁰² For plans of monuments and revetments in the Iranian territory and for a discussion of Ilkhanid architecture, three primary sources can be pointed to: the muqarnas vault plan on a stucco plaque discovered at Takht-i Sulayman (dating to the 1270s; see below), the Topkapı Scroll (late 15th century),²⁰³ and the architectural revetment and monument plan drawings of the Master of Bukhara from the sixteenth century.²⁰⁴

There are several reasons why drawings of monuments and revetments have not been preserved to the present days in a larger quantity and from earlier historic contexts.²⁰⁵ Plans of monuments and revetment designs were *working drawings* and they could have been discarded or reused after the completed tasks, because the notion of preserving samples of architects' and craftsmen's drawings as works of arts is a late notion.²⁰⁶ Moreover, if drawn on parchment (prior to the arrival of paper), drawings could have been reused for other writings, or even reworked into animal glue.²⁰⁷ Another possible reason for the low rate of survival of drawings could be the secrecy of the craft.²⁰⁸ Drawing of monument design was of essential significance for the architects to be able to design monuments of extensive dimensions, to determine proportions and complex organization, and for the transmission of ideas between architects and

¹⁹⁸ Lewcock 1984, 132; Harvey 1972, 98.

¹⁹⁹ Kostof 1977, 71-73.

²⁰⁰ Lewcock 1984, 129.

²⁰¹ *Ibid.*, 132. The earliest evidence of use of such models in the European territory dates to the ninth century, for the abbey of St. Germain d'Auxerre. The model of the entire complex was produced in wax. Kostof 1977, 74. Compare to Harvey 1972, 116, 118.

²⁰² Kostof 1977, 65. Compare to Mayer 1956, 20. Further evidence would be necessary in support of these assumptions.

²⁰³ See Aube 2017, 63-72.

²⁰⁴ See Lewcock 1984, 132.

²⁰⁵ Harvey 1972, 102-103.

²⁰⁶ Kostof 1977, 75.

²⁰⁷ *Ibid.*

²⁰⁸ Kostof 1977, 75; Harvey 1972, 103; Harvey 1973, 13.

persons involved in monument construction.²⁰⁹ In fact, the absence of preserved drawings of monuments from the Ilkhanid period cannot be considered as evidence of them not having existed.

Ground Plans

The earliest discovered drawings of monument plans are those by the Master of Bukhara, from the sixteenth century.²¹⁰ These drawings indicate that a modular system of plans which was employed for construction of monuments was used in architecture, but this was not necessarily the only type of design which could be used.²¹¹ Among these drawings, the majority are of architectural revetments and there are also four ground plans of monuments, which could not be identified.²¹² These ground plans are drawn on graph paper, and they comprise consistent manner of cross-hatching graphic convention for the indication of the thickness of walls and other elements.²¹³ Graph paper is indicative of the manner in which the draftsmen worked and it illustrates that they employed ruler, straight edges and compasses – tools already in use for Euclidean geometry.²¹⁴ Importantly, the use of a grid system for these plans indicates that there needed to exist a standardized module for design of these monuments and it had to be a neutral measuring device.²¹⁵ It is however not clear whether these drawings are works from a student book of notes, if they derive from a collection of building types, if these were drawings for monument construction for the builders, or if they are specific or eccentric buildings.²¹⁶ These works inform about the existence of architectural notation on paper and their sophistication points to a long, but yet unknown tradition.²¹⁷ The ratios of the grids could have been uncomplicated and could correspond to a certain number of bricks, which were likely of standardized dimensions. The existence of this type of drawings for architectural revetments during the Ilkhanid period is confirmed by the evidence of the use of a grid system for transfer of stucco designs for Square Kufic inscriptions and for the *Khatt-i banna'i* inscriptions, which have been discussed in this research work (see Chapter 3; Section 3.3).²¹⁸

It is not clear what type(s) of monument drawings the Ilkhanid architects produced. Based on the parallel of Gothic European drawings, these could be subdivided into three main categories: drawings for the patron, architect's own drawings to reach architectural solutions and working drawings for master builders and builders.²¹⁹ Evidence of grid and baseline incisions in Ilkhanid stucco revetments, which stem from a long tradition of this art, and which have been documented in pre-Ilkhanid stuccos, starting at least with early (10th century) stuccos at Na'in, provide evidence of the use of working drawings by stucco masters and craftsmen. It would be

²⁰⁹ Harvey 1972, 101.

²¹⁰ These plans are drawn on good quality paper from Samarkand, and the drawings of ground plans and other plans are performed on a grid of squares, which function as structural modules of the plan. Research of monuments in Uzbekistan indicates that the monuments were in fact built with the aid of such plans. See Lewcock 1984, 132; Bulatov 1987, 96-246.

²¹¹ Lewcock 1984, 132.

²¹² Holod 1988, 5.

²¹³ *Ibid.*

²¹⁴ *Ibid.*, 6.

²¹⁵ *Ibid.*

²¹⁶ Holod 1988, 6.

²¹⁷ *Ibid.*, 5.

²¹⁸ See the section concerning the design transfer of stucco revetments in Chapter 3, Section 3.1. The best examples of square grid incisions for design transfer into carved stucco medium were documented on the stuccos of the following monuments: the Ushturjan Friday mosque (Cat. No. 4), the Pir-i Bakran mausoleum (Cat. No. 2), the Haftshuya Friday mosque (Cat. No. 3).

²¹⁹ Kostof 1977, 87; Harvey 1972, 110-118; Harvey 1973, 33-39.

logical for the builders and master builders of these periods to also employ monument plans drawn according to the modular (square gird) system, such as the much later monument drawings of the Uzbek Master from Bukhara in the sixteenth century.²²⁰

Wilber mentions that for the outlines of the monument to be marked on the ground and during its construction, a measuring scale of some type had to be employed, regardless of the use of plans and drawings, but that this is not known precisely for the Ilkhanid period.²²¹ According to the manuscript sources this could be the *gaz* (normally translated as *ell* or *cubit*; the distance from the elbow to the end of the middle finger, c. 45 cm); the unit with the same name was also employed to measure textiles in during the Ilkhanid period.²²² According to Wilber's measurements of monuments and their examination, the Ilkhanid cubit amounted to approximately 26 cm, but this was not necessarily the standard for the entire territory of the Empire.²²³ Alternatively, the measuring units could be the length of the standard fired brick and bricklaying measuring stick, marked with the widths of a brick and its joint, but if so, they are not reflected by the monuments.²²⁴ Moreover, Wilber's research indicates that the dimensions of the bricks varied from monument to monument and that the dimensions of the monuments do not correspond to the proposed unit multiples.²²⁵ Wilber notes that monument structures were built with a considerable level of accuracy and care.²²⁶

According to Wilber, plans and drawings for monuments could have been produced on site, on large plaster slabs and their copies could have been conserved on a portable medium (such as paper), by their designers or builders' workshops and employed for future projects.²²⁷ Wilber notes that although similar in form, none of the Ilkhanid monuments is an exact copy of another one and similar monuments differ in their dimensions (compare, for example, monuments in Cat. Nos. 11, 15 and 29).²²⁸ Most likely, plans during the Ilkhanid period were produced with the system of a proportional notation, which Wilber demonstrates by the examination of the Ushturjan Friday mosque.²²⁹ Wilber informs that Ilkhanid monuments were subjected to changes in the original plan during their construction, such as the Çelebi Oğlu mausoleum at Sultaniyya, the Dashti mosque near Isfahan, the Kaj mosque near Isfahan, and the Iziran mosque near Isfahan.²³⁰ Wilber proposes that the architectural revetments of monuments needed to be taken into account during the monument construction, but that often craftsmen produced them when the monument was built and that for this purpose scaffolding had to be left standing in the monument.²³¹ He supports this claim by indicating that in several monuments, their structures were completed, but the revetments were not; these are the caravanserai of Sin (no longer extant), and the mosques of Dashti and Iziran.²³²

²²⁰ In the Romanesque England, from late tenth century until the beginning of twelfth century, planning was performed with design sketches on squared paper. Harvey 1972, 120, 124.

²²¹ Wilber 1955, 44.

²²² *Ibid.*, 44.

²²³ *Ibid.*, 44-45.

²²⁴ *Ibid.*, 45.

²²⁵ *Ibid.*, 45; compare to Meneghini 2009, 70.

²²⁶ Wilber 1955, 45.

²²⁷ Wilber 1955, 42.

²²⁸ *Ibid.*, 43.

²²⁹ *Ibid.*, 43.

²³⁰ *Ibid.*, 43.

²³¹ *Ibid.*, 43.

²³² *Ibid.*, 44.

Harvey provides evidence of deliberate imitation of extant buildings for new designs of monuments and study travels of architects to research the construction solutions for monument designs in medieval Europe.²³³ Similar has been proposed for Islamic architecture and in particular reference to the Ilkhanid monuments, it has been stated by Marco Giovanni Brambilla²³⁴ that the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) was inspired by the architectural solutions of the Sultan Sanjar mausoleum in Marv (1157)²³⁵ and the Taq-i Kisra at Ctesiphon (c. 540).²³⁶ It has also been suggested that Sinan must have observed and studied the mausoleum at Sultaniyya and employed it as a model for the Selimiye mosque in Edirne (1568-1574).²³⁷ A closer look at these monuments, especially the mausoleum of Sultan Sanjar and the Taq-i Kisra, demonstrates that they have little in common with the mausoleum of Uljaytu in terms of employed architectural solutions, but that they could have presented monuments of inspiration. Similar applies to Selimiye, the design and architectural structure of which differs considerably from the Uljaytu mausoleum, but the abstract form of these monuments is partially related. These cases of monuments reflect the practice of architects' observation of existing monuments, and their will to improve designs and refine proportions of the monuments.²³⁸

Drawings of Architectural Revetment Designs

Modular units employed by European medieval architects and builders varied greatly according to the geographical and chronological context.²³⁹ Gathered evidence from the Ilkhanid stuccos, their incisions of base lines, circles and grid lines, indicate that the situation in Ilkhanid Iran might have been similar (see, for example, Cat. Nos. 11, 15 and 29). Another piece of evidence is provided by the research of the Ilkhanid wall paintings and applied moulded and stencilled stuccos, for which this research confirms that their forms and designs were traced or determined in a different manner, by use of stencils and moulds. For some media the Ilkhanid architectural revetments templates of different kinds were therefore the essential part of their production process. Rather than the responsibility of the architect, production of these templates was practiced within the workshops themselves.²⁴⁰ There however exists no direct evidence for use of pattern books by Ilkhanid architectural revetment craftsmen's workshops, such as the pattern and study book of the European stonemason and architect Villard de Honnecourt (13th century).²⁴¹ Chronologically the closest parallel is provided by the Topkapı Scroll, which is a collection of architectural revetment drawings on grid plans; it must be a result of a long-standing tradition of production of architectural revetments.²⁴² Together with the listed evidence of grid incisions for design transfer into stucco medium, the Scroll indicates that similar drawings must have already existed in the Ilkhanid period and perhaps also during pre-Ilkhanid times.

²³³ Harvey 1972, 105.

²³⁴ Brambilla 2012, 6.

²³⁵ Knobloch 2001, 138; <https://archnet.org/sites/3954> (Last Accessed: April 14, 2021).

²³⁶ <http://www.iranicaonline.org/articles/ayvan-e-kesra-palace-of-kosrow-at-ctesiphon> (Accessed December 2, 2021); <https://archnet.org/sites/5282> (Last Accessed: April 14, 2021).

²³⁷ Kuban 2010, 295-312; <https://archnet.org/sites/1941> (Last Accessed: April 14, 2021).

²³⁸ Similar is proposed by Harvey. Harvey 1972, 105.

²³⁹ Harvey 1972, 108-109; Harvey 1973, 31.

²⁴⁰ Compare to Kostof 1977, 88-89.

²⁴¹ Binding and Nussbaum 1978, 1-21; Kostof 1977, 89; Harvey 1972, 30-31, 110-112; Harvey 1973, 38-39.

²⁴² The same system was also in use in Ancient Egypt, which indicates the long tradition of use of such types of plans and drawings for monument planning. Such system was also employed in Classical times for both, monument plans and revetment designs. Harvey 1972, 120.

Transmission of Architectural Models in Ilkhanid period

In order to provide the foundations for the understanding of architectural forms of Ilkhanid monuments it is necessary to consider how architectural models were transmitted on geographical and chronological scales. These issues have been discussed above all by Renata Holod and Bloom.²⁴³ Information they propose also regards the Ilkhanid period, and it is significant in comprehending the geographical distribution of the types of the Ilkhanid monuments, and the mobility of architects, master builders and craftsmen of architectural revetments.

The model for architectural transmission begins with the intentions of the patron and the architect or master builder; the process of constructing a building must have comprised plans, drawings and accounting, and it might have been impacted by the local building tradition and modalities (see Cat. No. 27).²⁴⁴ Architectural knowledge was transmitted according to the centre-periphery model, through interpretation of local knowledge and by written and visual accounts (see Cat. Nos. 27, 12, 29).²⁴⁵ The transmission of architectural knowledge in Islamic lands was of two types: the transmission of architectural knowledge through example and by means of verbal and visual notation; both models are results of continuity of earlier building traditions.²⁴⁶ The arrival of paper to the Middle East in the eight century transformed the notion of notation; the new, cheaper and recyclable medium impacted modes of transmission of knowledge, literacy, development of libraries and systems of notation.²⁴⁷ This determined the significance of paper in the process of transmission and reception of architectural knowledge and consequently the process of initial order, design and layout, on-site work, accounts and representation of finished building.²⁴⁸

Architectural design knowledge accordingly consisted of two components: the local building tradition where knowledge transmission was by example and where changes took place across a longer chronological span, and the literate architectural knowledge, where change could be rapid and trans-regional.²⁴⁹ This differentiation of the transfer of architectural knowledge may be applied to the comprehension of Ilkhanid architecture. Researched monuments have been arranged according to their architectural plan and chronological development (constructive and decorative phases). Their architectural features present examples of repetition of similar models which occur by example and unique types of monuments, of monumental dimensions, which must be the results of the work of expert architects and meticulous designs and plans. Among the studied monuments, the best example is proposed by the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) which features a specific design and architectural solutions.

Holod states that works of practical geometry manuals existed and that they were in continuous use.²⁵⁰ According to Holod, al-Buzajani's work represents evidence of written and mnemonically derived system of geometric construction, which was easier to transmit via paper

²⁴³ Holod 1988; Bloom 1993; Bloom 2006.

²⁴⁴ Holod 1988, 11.

²⁴⁵ Holod 1988.

²⁴⁶ *Ibid.*, 1.

²⁴⁷ *Ibid.*, 2.

²⁴⁸ Holod 1988, 2.

²⁴⁹ *Ibid.*, 2.

²⁵⁰ Holod 1988, 4. Compare to Necipoğlu 2017, 11-78.

than by example.²⁵¹ The notation of plans aided the introduction of new types, styles and structures into the body of common architectural knowledge of a given chronological and geographical context.²⁵² The notation systems enabled there to be distance between the place of the monument's design (its drafting on paper or other support) and the transmission of this design and its construction according to the local building tradition in a place different to the drafting of the design.²⁵³ Such scenarios are confirmed for the Ilkhanid period: the best example is the madrasa Shamsiyya (Cat. No. 29), the funerary complex for which written sources state that its plan was drafted in Tabriz and brought to Yazd (perhaps accompanied by builders and artisans) together with the body and the coffin (sarcophagus) of its deceased patron Shams al-Din.²⁵⁴ This evidence points towards transmission of and introduction of a new architectural model of a funerary complex from north-western to central Iran.

Bloom debates the idea of the possible longevity of an architectural model, which continued to provide an example for other monuments for a long time span of several centuries; such exemplary monuments were visited by builders, their design was abstracted and subsequently replicated, and this was the primary means of transmission of architectural models.²⁵⁵ This is to a certain extent true also for Ilkhanid architecture, where the analysis of ground plans of monuments enabled their grouping according to type and plan. Moreover, transmission of architectural models by example is well discernible in the case of mausolea and mosques, where not only ground plans, but also other solutions such as transitional zones of domed structures and vaulting solutions repeat across the territory of Ilkhanid Empire. Nevertheless, another function of architectural models needs to be acknowledged. Exceptional architectural structures of monumental dimensions, such as the mausolea of Ghazan Khan and Ghazaniyya (1297-1305)²⁵⁶ and especially the mausoleum of Uljaytu in Sultaniyya (Cat. No. 27), or the mausoleum of 'Ali Shah in Tabriz (1310-1320),²⁵⁷ required specific architectural solutions. These commissions fostered inventions of new architectural solutions, which spread across a more extensive geographical unit upon monument completion, through migration of builders and master builders to other commissions, in a manner similar to the mobility of craftsmen responsible for architectural revetments of these monuments (see, for example, Cat. No. 27).

According to Bloom, construction of the domed structure preceding the mihrab of the Isfahan Friday mosque was likely the response of Malikshah to his visit of the Damascus Friday mosque; the Isfahan model served for the construction of other domed prayer hall mosques of the Seljuq period.²⁵⁸ This is successfully contested by Korn.²⁵⁹ Recently, Korn provides new evidence indicating two earlier cases of domed structures in north-western Iran, which were

²⁵¹ Holod 1988, 4. Bloom contrasts this hypothesis, by stating that it is unlikely that this work was intended as a practical manual for builders and craftsmen, because the knowledge transmission in the Medieval period mainly took place by the means of the system of apprenticeship and that al-Buzajani's work should be comprehended within the literary genre of *adab*, rather than as a practical manual. Bloom 1993, 21.

²⁵² Holod 1988, 7.

²⁵³ *Ibid.*, 10.

²⁵⁴ Blair 1986a, 33; Bloom 2006, 296.

²⁵⁵ Bloom 1993, 24.

²⁵⁶ Wilber 1955, 124-26; <https://archnet.org/sites/1677> (Last Accessed: April 14, 2021).

²⁵⁷ Brambilla and Moradi, "The Mausoleum of Ali-Shah; Fifty Years of Misunderstanding," Paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021; <https://archnet.org/sites/1678> (Last Accessed: April 14, 2021).

²⁵⁸ Bloom 1993, 24.

²⁵⁹ See Korn 2008, especially 112-13.

more likely models for other such monuments, compared to the Isfahan Friday mosque.²⁶⁰ This architectural model transmission type required presence builders' group which possessed the expertise necessary for domed hall construction in order to construct such monuments. While these monuments could all serve as architectural examples, there needed to be knowledge of how to build them and sufficient resources. In fact, evidence of mobility of builders' groups has been observed during the course of this research, which indicates that the Seljuq Friday mosque of Sujas (Cat. No. 35) and the Friday mosque of Qurva were very likely works of the same builders' workshop.²⁶¹ Similar mechanisms of mobile building workshops likely existed in Ilkhanid times, when builders' groups determined the spread of specific architectural forms, solutions and models, across the Iranian territory, by the means of their very mobility for specific commissions.

h.) The Role of Paper for Ilkhanid Architecture and its Revetments

According to Bloom, descriptions of monuments in written sources, as verbal systems of representation, were another modality of transmission of architectural models in medieval Islamic world.²⁶² Judging from the extant evidence, it is more likely that the transmission by model was more significant in forming the bulk of architectural knowledge, compared to historic descriptions of monuments, which reflect interest of the learned concerning monumental structures. Bloom suggests that one of the landmarks in notation of architectural models was the availability of paper and that widespread use of notation systems emerged around 1250.²⁶³ But prior to arrival of paper to the Islamic lands (as a consequence of the 751 battle of Atлах/Talas in modern Kyrgyzstan), there existed other material, such as papyrus and parchment on which plans and drawings of monuments could also be noted.²⁶⁴ According to Bloom, availability of paper transformed the medieval Islamic world into a paper society, which worked and thought in new and different ways: for architecture, the increased availability of paper determined more frequent use of personal notations for sketches and plans and the ease of transportable paper determined formation of a collective notation system and transfer of visual material across a greater geographical area.²⁶⁵ As mentioned, evidence of such transfer of architectural plans is provided by the Shams al-Din funerary complex in Yazd (the Shamsiyya; Cat. No. 29) for which the plan was reportedly drawn in Tabriz.²⁶⁶

Bloom notes that paper functioned as an intermediary medium for creation of works of art and an intermediary between inspiration and creation.²⁶⁷ According to Bloom, the availability of larger sheets of paper, for lower prices and its more widespread availability, determined its more frequent use by artists around the thirteenth century.²⁶⁸ But, looking at characteristics of architectural forms (for example, the domed prayer halls) in Iranian territory, no specific break is visible between Seljuq and Ilkhanid architecture, which could reflect increased use of paper. Moreover, recent research reveals that some architectural forms understood as typically Seljuq

²⁶⁰ Lorenz Korn, "What were the earliest dome chambers in Iranian mosques? An Archaeological Perspective," Paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

²⁶¹ It seems that this group of builders also collaborated closely with a specific stucco workshop, which moved together with the builders for construction of the two mosques and the Pir mausoleum at Takistan.

²⁶² Bloom 1993, 25-26.

²⁶³ Bloom 1993, 26.

²⁶⁴ Although more expensive, similar to manuscripts, these materials have likely been used for the purpose.

²⁶⁵ Bloom 1993, 27.

²⁶⁶ Bloom 2006, 296.

²⁶⁷ *Ibid.*, 289.

²⁶⁸ *Ibid.*, 289.

might have existed already in pre-Seljuq times.²⁶⁹ If so, paper either did not impact greatly the design of monuments, or it was already in consistent use in pre-Ilkhanid times. Bloom proposes that famous manuscript calligraphers did not design inscriptions for monuments, but made drawings from them, which were reproduced (realized) by craftsmen in different media (based on these preparatory drawings).²⁷⁰ Moreover, Ilkhanid stucco craftsmen (and other craftsmen) did not study manuscripts and other works of art to produce their own designs, but manuscript calligraphers also produced drawings on paper which other artisans could realize on diverse scales in various media.²⁷¹ The proposed hypotheses in fact fit with the finds of this research and seem to be the most logical solution to the question of designing stucco revetments. They are also partially confirmed by the evidence proposed by the Topkapı Scroll, which seems to be a collection of designs for architectural revetments.²⁷²

Bloom rightly concludes that the increased availability of paper in Ilkhanid period enabled further specialization of labour in Ilkhanid art and that design became more and more separated from its production, but that the designs became more homogenous due to the aid of the notation system for art objects and architectural revetments.²⁷³ In the case of carved stuccos, this research revealed that there are numerous similarities with stuccos of Seljuq period. If paper was significant for stucco art, it thus must have been employed for the carved stucco revetment design process already in Seljuq and earlier times. On the other hand, a greater frequency of wall painting revetments in Ilkhanid period, which required use of stencils, might be the result of paper availability. In terms of separation of design process from stucco revetment production, the two activities seem to have always been interconnected in carved stucco medium, due to the modality of production of carved stucco reliefs. Stuccos were carved out of several layers of stucco material, which were applied and carved in sequence; this required for design to be split in different visual planes and applied on the stucco surface prior to the carving of every layer of stucco material. This must be taken into consideration as a point of departure at the time of drawing of stucco designs. If so, the stucco design process and production of carved stuccos were closely connected to each other, rather than separated.

2.2 Ilkhanid Architectural Forms

a.) Classes of Structures

Wilber divides Ilkhanid monuments into two broad groups: those with religious character and secular monuments.²⁷⁴ He proposes that religious monuments comprise: the mosque, the madrasa and the mausoleum, and he states that shrine complexes are composed out of combinations of these three major classes of monuments. It would be however more opportune to consider shrine complexes, or pilgrimage complexes, as a monument group in its own right. Their function is different, compared to mosques, mausolea and madrasas, and the modality in

²⁶⁹ Korn successfully demonstrates existence of two domed prayer halls at the Sava and Tabriz Friday mosques already in the early Islamic period. Lorenz Korn, "What were the earliest dome chambers in Iranian mosques? An Archaeological Perspective," Paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

²⁷⁰ Bloom 2006, 290-292.

²⁷¹ *Ibid.*, 295. Bloom however proposes that the signatures found on revetments pertain to calligraphers who design it, but this research reveals substantial evidence arguing that these are signatures of heads of craftsmen who led the workshops in production of architectural revetments. See Bloom 2006, 300-301.

²⁷² In fact, the gridline system of the designs contained in the Topkapı scroll drawings of architectural revetments, was the modular system which enabled the craftsmen to transfer the design on a larger architectural surface with the aid of the gridline system.

²⁷³ Bloom 2006, 301.

²⁷⁴ Wilber 1955, 35.

which these monumental complexes formed is a separate phenomenon. For secular monuments, Wilber notes that monuments are of smaller number, compared to religious ones, and that they comprise ruins of a palace (Takht-i Sulayman), traces of an observatory (Maragha) and three damaged caravanserais (caravanserais of Sin, Sarcham and Marand). Written sources however indicate that there existed several secular residences of Ilkhanid rulers and further structures such as kiosks (see Chapter 2; Section 2.2).

The level of preservation of monuments is uneven and it does not give justice to secular monuments and to structures which were built out of less resistant material such as adobe or clay walling. This research also demonstrates that many religious monuments thought to date from the Ilkhanid period, actually comprise earlier constructive and decorative campaigns and an extensive number of these monuments was rebuilt or redecorated in post-Ilkhanid times. This research illustrates that an important characteristic of Ilkhanid period were structural modifications and redecoration interventions on pre-Ilkhanid structures which took place especially in the Early and Golden Ilkhanid periods.²⁷⁵ One thus does not give justice to Ilkhanid builders and craftsmen by only looking at monuments which were built in Ilkhanid times; one must look at further cases of rebuilding, repairs and redecorations in order to fully comprehend features of Ilkhanid architecture. Monuments of religious character were in continuous use through centuries and frequently until the present times; this determined their preservation, although many structures were altered through modern interventions. This was not the case with secular structures, which did not retain their function and thus were not up kept, rebuilt, repaired or redecorated, rather, they were left to the oblivion. The described difference between these two classes of structures is one of the main reasons behind the disparity in preservation of Ilkhanid monuments.

Mosques

Wilber proposes characteristics of the “standard Ilkhanid mosque,” informing that the formation of its plan began in Seljuq period and that its use continued in Timurid and Safavid times.²⁷⁶ Mosque plan consists of four juxtaposed *iwans* facing its central courtyard surrounded by prayer halls; the *qibla iwan* leads into the central prayer hall of square form topped by a monumental domed structure; the monument is rectangular and its longitudinal axis is directed towards Mecca. The earliest such plans date from Seljuq period. For Ilkhanid period, the Varamin Friday mosque (Cat. No. 28) presents the best example of such ground plan and it is perhaps the only such mosque built in one constructive campaign, which took place from around 1322 until 1325-26 (as indicated by its historic inscriptions).

A closer look at Ilkhanid monuments reveals that the described four-*iwan* mosque type is represented by only one extant Ilkhanid monument.²⁷⁷ In fact, one of the most frequently employed ground plans for Ilkhanid mosques, judging from extant examples, is the mosque with a domed prayer hall and two juxtaposed *iwans* on the *qibla* axis interrupted by a courtyard and flanked by hypostyle prayer halls. Four such mosques were also decorated with carved stucco: the Gar Friday mosque (Cat. No. 7), the Haftshuya Friday mosque (Cat. No. 3), the Ushturjan Friday mosque (Cat. No. 4) and the Khusraw Shir Friday mosque (Cat. No. 17). The

²⁷⁵ For example, those interventions on the Gar Friday mosque (Cat. No. 7), the Haftshuya Friday mosque (Cat. No. 3), the Isfahan Friday mosque (Cat. No. 1) or the Pa Minar mosque at Zavara (Cat. No. 6).

²⁷⁶ Summary from: Wilber 1955, 35-37.

²⁷⁷ The other mosque featuring a similar type of plan, but built in several construction campaigns, is the Abarquh Friday mosque (Cat. No. 10).

majority of these architectural structures were, as demonstrated in this research, built on foundations of earlier monuments and it is likely that they adopted ground plans of earlier, mainly Seljuq, structures. They thus present evidence for transmission of architectural models from the pre-Ilkhanid into Ilkhanid period. Other Ilkhanid mosques in north-western and north-eastern Iran (for example: congregational mosques of Tabriz, Urumiya and Marand) might have also featured such plans, but they were rebuilt in subsequent periods and it is thus challenging to comprehend characteristics of their original ground plans.

Other mosques characteristic of Ilkhanid period comprise structures with arcaded courtyards interrupted by *iwans* and with a domed square prayer hall, not all of them always employed. Some examples of such monuments proposed by Wilber are: The Friday mosque of Bistam (this is a rebuilding of an earlier structure; Cat. No. 18), the Congregational mosque of the 'Abd al-Samad complex at Natanz (built over an earlier mosque and comprising a funerary monument, Cat. No. 12), the Ushturjan Friday mosque (a rebuilding of an older structure; Cat. No. 4), the Farumad Friday mosque (its first phases may date to Seljuq period; Cat. No. 16), the Kirman Friday mosque and the Pa Minar mosque in Kirman.²⁷⁸ Wilber classifies seven mosque structures as *non-standard*: the Baba 'Abdullah mosque at Na'in (considered in this research as a complex consisting of a mosque and a mausoleum; Cat. No. 10), the Friday mosque of Ardabil,²⁷⁹ the 'Ali Shah mosque in Tabriz (new evidence suggests that this was a monumental mausoleum),²⁸⁰ the Dashti Friday mosque, the Kaj Friday mosque, the Iziran Friday mosque (these mosques were not completed) and the Gunbad mosque of Azadan (this is a monument of a post-Ilkhanid date).²⁸¹

Madrasas

Wilber documents four madrasa structures pertaining to Ilkhanid period; out of these, three present the *standard* and one the *non-standard* plan.²⁸² He notes that the standard plan of Ilkhanid madrasas is closely related to that of mosques and that they could be called *mosque-madrasa* plans. Their structure is similar and it consists of a courtyard flanked by arcade structures of one or two storeys and juxtaposed *iwans*, which could be two or four. The function of these spaces is however different. In the case of madrasa, the arcades flanking the courtyard do not form prayer halls, but halls for teaching and accommodation of pupils. Revision of monument construction campaigns and functions in this research indicates that in Ilkhanid period, theological schools were rarely built as independent structures, but rather, they were parts of multi-functional complexes. Written sources report that theological schools were parts of complexes in Tabriz, at the Ghazaniyya and at the Rashidiyya. The only structures for which there exists material evidence are the theological schools, which were parts of funerary complexes in Yazd (Rukniyya, Shamsiyya and Kamaliyya; Cat. No. 29).²⁸³

²⁷⁸ Wilber 1955, 35.

²⁷⁹ Wilber 1955, 134-135; https://archnet.org/sites/5426/media_contents/40825 (Last Accessed: April 15, 2021).

²⁸⁰ Brambilla and Moradi, The Mausoleum of Ali-Shah; Fifty Years of Misunderstanding, paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

²⁸¹ Wilber 1955, 36.

²⁸² Wilber classifies that Shamsiyya funerary complex in Yazd (Cat. No. 29) as a madrasa. Moreover, Wilber documents one madrasa twice: the madrasa of the Isfahan Friday mosque and the Madrasa Imami are actually the same structure and of a late to post-Ilkhanid date. It is not clear which is the fourth structure of a madrasa he states to have documented. *Ibid.*, 36.

²⁸³ In fact, not much is known concerning madrasa of the Ilkhanid period, and further excavations of monuments would be necessary to understand them better.

Mausolea

Wilber divides mausolea structures into two-subgroups: a square chamber topped by a dome and a tomb tower.²⁸⁴ Tomb towers feature round, square and polyhedral plans and they differ from mausolea in their form which accentuates their vertical axis. This classification does not give justice to monuments in Qum, which are of three main types and should not fall into category of tomb towers. Wilber notes that the majority of these structures are covered by double-shell domes and that in more than half of cases, they also comprise a mihrab. Some of the mausoleum structures top separated underground crypts, where the deceased were buried, which can be entered from their interiors or exteriors.

According to Wilber, the majority of Ilkhanid mausolea were *imamzadas* (places for burial of descendants of the Twelve Shi'ite Imams), the visits to which would give blessings (*Baraka*) to the faithful. In this respect, presence of mihrabs in the structures played an important role in allowing the faithful to discern the orientation for the prayer rites. According to Wilber, the mausolea should be considered as one of primary architectural features of Islamic architecture. Compared to the Seljuq period, the variety of architectural forms of Ilkhanid mausolea is less variegated and they are smaller in their total number. The reason might be a greater popularity of mausoleum construction in Seljuq period, with the exception of numerous mausolea, which were constructed in Ilkhanid Qum.

Graves of saints and mausolea in many cases present the starting point of development of extensive pilgrimage complexes. These complexes developed through rebuilding of mausolea and addition of adjacent structures with further functions, mainly for the purpose of catering for pilgrims. The perceived reduced number of mausolea in Ilkhanid period is thus partially determined by the fact that many of them were integrated into larger complexes. Some of the best examples are presented by: the Alinja Khanqah (Cat. No. 26), the Pir Husayn Khanqah (Cat. No. 25), the Kharaqani complex (Cat. No. 21), the Baba Afzal complex (Cat. No. 14) and the Baba 'Abdullah mosque and mausoleum (Cat. No. 11). These monuments were transformed from mausolea into pilgrimage complexes; their function was mitigated and transformed through patronage of constructive and decorative interventions.

Funerary Complexes

One specific group of monuments, which is not recognized in their own right by Wilber, but is characteristic of Ilkhanid architecture are *funerary complexes*. These structures consist of complexes built in one constructive campaign, which comprise tomb of patrons and other structures of the pious endowment such as madrasas, water reservoirs, etc. One of the earliest such structures is the Ghazaniyya, the complex with the mausoleum of Ghazan Khan, which retained multiple functions, but the form and plan of which are not known.²⁸⁵ A similar complex, or a city quarter was also instituted by Rashid al-Din, the Rabi-i Rashidi.²⁸⁶

This architectural form is likely to have been subsequently transferred from north-western Iran to the area of Muzaffarid Yazd. There, monuments such as Rukniyya, Shamsiyya and Kamaliyya (Cat. No. 29) might be mausolea nowadays, but originally these funerary structures represented central parts and focal spaces of more extensive pious complexes comprising theological schools, institutions of time, mosques, water reservoirs etc. These complexes

²⁸⁴ Summary from: Wilber 1955, 36.

²⁸⁵ Wilber 1955, 124-126; <https://archnet.org/sites/1677> (Last Accessed: April 15, 2021).

²⁸⁶ Wilber 1955, 129-131; <https://archnet.org/sites/3884> (Last Accessed: April 15, 2021).

impacted the urban structure of Yazd and provided for the infrastructure tied to the religious and scholarly activities. They differ from pilgrimage complexes, because their focal point is presented by a mausoleum of a secular personage rather than a revered religious character. These complexes were envisioned as works of one constructive campaign, rather than works of continuous constructive and decorative interventions which spanned several centuries. Their ground plans are more homogenous, compared to pilgrimage complexes.

Pilgrimage Complexes

Wilber does not classify pilgrimage complexes as a monument type in its own right, stating that these complexes consist out of different units of basic monument types (mosque, mausoleum, madrasa).²⁸⁷ In this research, I argue that pilgrimage complexes should be comprehended as a type of monuments in their own right, for several reasons. These monuments were rarely works of one constructive and decorative intervention. They developed from a small mausoleum with the tomb of a mystic, a Sufi or a learned religious authority into multi-functional pilgrimage complexes.²⁸⁸ At Turbat-i Jam (Cat. No. 30), Pir-i Bakran (Cat. No. 2), Bistam (Cat. No. 19), Natanz (Cat. No. 12), Qala-yi Naw (Cat. No. 21), Alinja (Cat. No. 26) and Qubalıbalaoğlan (Cat. No. 25) the complexes retained structures such as mosque(s), other mausolea, monumental entrance portals, seclusion rooms, courtyards, shrines, minarets, stables, service rooms and *khanqahs*, to cater for pilgrims and Sufi orders. These complex formations are results of several constructive and decorative interventions and through different acts of patronage, across longer time spans, which reached beyond the Ilkhanid chronological frame. While they do not present a unified ground plan or a design, they are characteristic of the Iranian territory and the Ilkhanid period, when sponsorship of such complexes was particularly in vogue. The function of these complexes was to attract pilgrims, and to cater for their needs, in terms of accommodation, spaces for religious rituals and congregation. They are thus different from funerary complexes, mausolea or *imamzadas*.

Caravanserais

Wilber documents three caravanserais in his research: the Sin caravanserai (no longer extant), the Sarcham caravanserai (near Zanjan, built during the reign of Abu Sa'īd) and caravanserai near Marand (Alaki caravanserai; built during the reign of Hülagü; its revetments were recently transferred to Tabriz).²⁸⁹ These caravanserai structures, compared to madrasas, feature fortified enclosures with bastions and larger courtyards for animals of caravans. Among these caravanserais, the Alaki caravanserai is the most significant for research of Ilkhanid architectural revetments. Documented remains of its entrance portal indicate that it featured a lavish repertoire of architectural revetments produced with tile mosaic and a combination of fired brick and glazed element techniques.²⁹⁰ Blind niches flanking the entrance portal employ the niche forms, which reflect forms of interior niches of carved stucco mihrabs of the Marand and Urumiya Friday mosques (Cat. Nos. 22-23).²⁹¹ Revetments of this early Ilkhanid caravanserai also indicate that some artistic techniques of Ilkhanid revetments might have developed earlier, compared to what is proposed by scholars.

²⁸⁷ Wilber 1955, 36-37.

²⁸⁸ They are best described by Golombek, as little cities of God. See Golombek 1974.

²⁸⁹ Wilber 1955, 37. For current research of the monument, see Moradi and Omrani 2014.

²⁹⁰ This is in fact one of the few known Early Ilkhanid structures, which was built during the reign of Hülagü Khan.

²⁹¹ The specific corbelled-like form of these niches might be result of regional developments, because it was not documented on monuments in other regions of Ilkhanid Empire.

The three listed caravanserais illustrate that also in Ilkhanid period, there existed the practice of reveting caravanserai structures with lavish revetment repertoires. This is similar to Seljuq period, as exemplified by two caravanserais in north-eastern Iran, the Ribat-i Mahi (1019-1020)²⁹² and the Ribat-i Sharaf (1114-1115; redecorated in stucco in 1154-1155).²⁹³ These two caravanserais, especially the Ribat-i Sharaf, retain extensive architectural revetment programmes in carved stucco, fired brick and terracotta. Such repertoires in carved stucco in caravanserais have not been documented for the Ilkhanid period.²⁹⁴

Palaces

The well-known but sporadically excavated Ilkhanid secular monument is the Ilkhanid summer palace of Takht-i Sulayman (1270s; Abaqa Khan).²⁹⁵ At Sultaniyya, must have also existed a palace, but so far, archaeological research did not yield any information concerning its location. Despite numerous excavation campaigns and research, the lack of a comprehensive publication determines limited understanding of the Takht-i Sulayman complex. It was first a Sassanid fire temple, built around fifth century. Later, it was used in Seljuq period.²⁹⁶ A monumental summer palace was constructed on the site during the reign of Abaqa Khan (r. 1265-1281). The palace comprised numerous spaces and a reception hall formed by a monumental *iwan*.²⁹⁷ The site was richly decorated with a monumental repertoire consisting of carved stucco, glazed moulded, Lajvardina, lustre and other types of tiles.²⁹⁸ The peculiarity of these revetments is the large number of animate figures and scenes (themes from the *Shahnama*, mystical creatures such as phoenix and dragon, birds, etc.). Function and presence of these revetments has been extensively debated, without a conclusive statement concerning their interpretation and meaning.²⁹⁹ The most likely explanation is that these animate figures could have been interpreted as specific symbols connected to the royal architectural complex which they adorned. Research by Yves Porter and Patrick Donabédian illustrates that the site and other palaces might have been source of these tiles for tile re-use on other monuments (Ilkhanid religious structures and churches in the Caucasus region) already in Ilkhanid period, soon after their production.³⁰⁰ Exact understanding of the function and meaning of these animate figures, the majority of which derives from China, is challenging to comprehend, due to the lack of evidence and written sources, which would indicate their understanding in Ilkhanid period.³⁰¹ The monumental summer palace complex at Takht-i Sulayman should be understood as evidence of existence and characteristics of Ilkhanid palaces, which must have been greater in number, in conjunction with other secular monuments.

²⁹² Korn 2018b; <https://archnet.org/sites/3861> (Last Accessed: April 15, 2021).

²⁹³ Kiyani 1981; <https://archnet.org/sites/3873> (Last Accessed: April 15, 2021).

²⁹⁴ Wilber mentions presence of carved stucco at the Sarcham caravanserai.

²⁹⁵ Wilber 1955, 112; Huff 1978; Naumann and Naumann 1976.

²⁹⁶ This is well reflected by the archaeological finds from the site, which date from the Seljuq period and are stored in the storages of the Berlin Museum of Islamic Art. Visit to the museum storage to look at these finds was performed in September 2018.

²⁹⁷ See Naumann and Naumann 1969, 35-65.

²⁹⁸ The excavations at the site revealed remains of kilns which might have been employed for production of some of these revetments, but the lustre and Lajvardina revetments were most likely brought from Kashan.

²⁹⁹ See Quchani 1992; Masuya 2019, 95-113.

³⁰⁰ See Donabédian and Porter 2017.

³⁰¹ See Grbanovic 2021.

b.) Monuments Mentioned in Written Sources

Wilber provides a list of Ilkhanid monuments, which are known only from primary written sources.³⁰² These monuments indicate that a considerably more extensive number of secular structures was built in Ilkhanid period, compared to the currently known and researched sites. These structures might have been of different architectural forms, dimensions and materials, compared to the Takht-i Sulayman palace. But many of them were likely lavishly decorated with diverse types of architectural revetments, which may have comprised carved stucco programmes.

Other Ilkhanid Monuments

The research of written sources by Wilber also indicates that in addition to religious Islamic and secular monuments, other types of monuments of Christian and Buddhist religion were built during the Ilkhanid period, and some of them were sponsored by the ruling class. These sources suggest that the Ilkhans were active patrons of Christian religious sanctuaries, mainly located in north-western Iran and the region of the Caucasus. Patronage of monuments such as churches and monasteries was characteristic of the Proto and Early Ilkhanid periods and it was not practiced after the official religion of the Empire became Sunni Islam. Similar can be observed for Buddhist monasteries, which were actively sponsored until Ghazan Khan's conversion. One extant ruined example is the Viyar Buddhist temple in proximity to Sultaniyya.³⁰³ It indicates that these monument models and construction modalities could have been foreign to the Iranian territory. The rock-cut temple features two monumental rock-carved reliefs of dragons (5 m in length each), which display iconography similar to the dragons of the Chinese territories. Little research has been conducted on these monuments, which still lack a thorough comprehension. The Chinese dragon iconography at Viyar might reflect the presence of foreign artists in the Early Ilkhanid period in the Iranian territory.³⁰⁴

c.) Relation of Structures to their Sites

Wilber proposes information concerning the relation of the Ilkhanid monuments with their surroundings.³⁰⁵ He notes that the surroundings of almost all the monuments had been altered since their construction, but that it is nevertheless possible to propose some general considerations regarding the practices connected to monument construction and their urbanistic context. He suggests that the mausolea were intended to be built as free-standing structures to be seen from all sides. While this might be true for the majority of the structures, those in settlements would often be transformed, through the passing of time, into monuments surrounded by urban contexts and their size could be reduced for these reasons.³⁰⁶ Wilber states that monuments, such as royal mausolea, were frequently built at selected sites and adjacent to already extant pilgrimage complexes, shrines or other significant funerary structures. Mausolea were often constructed in cemeteries located outside of the gates of the settlements' enclosure walls, such as in the case of Qum (Cat. No. 15). In some instances, cemeteries where the

³⁰² Wilber 1955, 190-191.

³⁰³ See Azad 2011.

³⁰⁴ The possible presence of foreign artists and craftsmen might also provide an explanation for the frequent use of Chinese imagery in tile revetments of the Ilkhanid period.

³⁰⁵ Summary from: Wilber 1955, 38-41.

³⁰⁶ See the monuments of Yazd, Cat. No. 29.

monuments were built are no longer extant or were even removed from the sites.³⁰⁷ Moreover, similar to the mausolea, the caravanserais were also constructed as freestanding monuments, on strategic locations along communication routes and near town gates. Wilber mentions that the incomplete structures of the Friday mosques of Kaj, Iziran and Dashti were likely parts of the mechanisms of creating new settlements and were intended to function as their focal points, but that they were not completed and that settlements did not form around them. Other monuments, above all mosques, had a fixed orientation towards Mecca and they were characterized by a longitudinal axis. These structures were constructed in urban settlements and became part of the urban networks. In some cases, the pre-existing urban context partially determined the form of monuments and their ground plan. On other occasions, space was made available for newly built monuments, or they were constructed on the sites of earlier structures as rebuilding and redecorative campaigns.

The exteriors of the majority of the Ilkhanid monuments were either undecorated or less decorated, compared to their interiors. The only architectural element of the monument exterior, which was given particular decorative attention, was the entrance portal of the monuments and occasionally their dome. Nevertheless, several monuments retain traces and fragments of exterior revetments which indicate that they used to feature elaborate façades produced with revetments employed for decoration of their interiors.³⁰⁸ This gradually changed during the post-Ilkhanid period (under the Aq Quyunlu and Timurid dynasties), when tile mosaic and other types of glazed revetments were employed to decorate architectural exteriors and more emphasis was given to entrance portals.³⁰⁹ The reason for the limited decoration of exteriors during the Ilkhanid period might be purely pragmatic, such as the cost of revetments and their susceptibility to weathering agents. There are several Ilkhanid monuments with elaborate exterior revetment programmes, which indicate that a conscience for revetments and exterior design of monuments existed. Perhaps the best example is presented by the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) which features a monumental tile-clad dome visible from the distance. The second example is presented by the third decorative phase at the Pir-i Bakran mausoleum (Cat. No. 2), dated 1312-1313, which comprised covering of the majority of the mausoleum's exterior with glazed tiles; the façade of the mausoleum's *iwan* also retains remains of carved stucco panels, indicating that it was carefully designed. One further example is provided by the 'Abd al-Samad complex at Natanz (Cat. No. 12) which displays a façade consisting of two entrance portals, a minaret base and further intermediary surfaces.

Wilber's conclusion suggests that builders and craftsmen concentrated on interiors rather than exteriors of monuments, and that more elaborate practices of architectural devices as known in the West (opening of vistas, climatic arrangement of successive structures or elements of the same structure, establishment of important communication means to a major monument or planned relationship between important structures located in the same area) did not exist, but this is not entirely justified.³¹⁰ Wilber proposes that in the case of pilgrimage complexes, which were built across more than one construction campaign, a *growth of complex structures by*

³⁰⁷ For example at the Garladan mausoleum in Isfahan and the Pir-i Bakran mausoleum south of Isfahan (Cat. No. 2).

³⁰⁸ This tradition is already well visible in the Seljuq period, for example at the Gunbad-i 'Alawiyan in Hamadan.

³⁰⁹ The latest research on artistic techniques and aesthetics of these periods is presented by Aube. See Aube 2017; Sandra Aube, "Ceramic tile decoration in 15th-century Tabriz," Paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

³¹⁰ Wilber 1955, 40.

agglomeration can be observed.³¹¹ He proposes that the careless disposition of structures around a central core element is typical of the Islamic architecture of Iran and that it can be found during the Ilkhanid period in the monuments which were built in a short time span (such as the Bistam and Natanz complexes; Cat. Nos. 19, 12). This research provides evidence indicating that these monuments in fact pre-date the Ilkhanid period; the structures which existed on the sites determined the arrangements of the Ilkhanid complexes. Furthermore, the mentioned logic of agglomeration in these and other complexes (Turbat-i Jam, Baba ‘Abdullah in Na’in, Baba Afzal in Maraq, etc.), was performed according to the possibilities offered by the sites and it must have reflected the size of the available endowments and trends of monument construction in every historic moment. The presumed disorganized and haphazard agglomeration of structures into complexes is therefore only apparent. Their ground plans in fact reveal a tendency of organizing the numerous parts of complexes according to axes, around courtyards, and as aligned to existing communication infrastructure; they are thus not as chaotic as proposed.

2.3 Building Methods and Construction Material in Ilkhanid Monuments

a.) Fired Bricks and Brickwork

The majority of the extant preserved Ilkhanid monuments were built out of fired brick. There however exists a number of Ilkhanid monuments which were constructed with adobe brick and occasionally, clay walling (rammed earth) technique was employed. Some monuments were built with a combination of different materials. Ashlar masonry was not common during the Ilkhanid period, but some monuments retain ashlar foundations.³¹² This is a considerable difference, compared to geographical areas such as Syria, Egypt, Tunisia and Maghrib.³¹³ Use of rubble or rough-hewn stone masonry pertained to the Sasanian architecture in the Iranian territory, but it required a lesser level of stone working skills, compared to ashlar masonry. Rubble masonry is occasionally encountered in Ilkhanid monuments, where it is a result of the proximity and availability of such material.³¹⁴ The construction of structures out of fired brick is considered to be characteristic of the building tradition in the Iranian territory.³¹⁵ Fired bricks were of varying dimensions; they could be cut off at an angle or partly rounded off.³¹⁶ They could also be employed in combination with rubble (or rough-hewn stone), but this was rarely the case for Ilkhanid Iran.

³¹¹ *Ibid.*, 40.

³¹² Such as the Alaki caravanserai. See Moradi and Omrani 2014.

³¹³ Marçais, G., “Binā’”, in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. http://dx.doi.org/10.1163/1573-3912_islam_SIM_1422 (Last Accessed: March 19, 2021) First print edition: 1960-2007.

³¹⁴ For example at the Pir-i Bakran mausoleum (Cat. No. 2) near Isfahan or the Afīn Friday mosque in the Khurasan region, which seems to be the work of different construction stages from the 12th century onwards with repairs in the Safavid period.

³¹⁵ Al-Hasan and Hill 1986, 74; Shatzmiller 1994, 209. See also Marçais, G., “Binā’”, in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. http://dx.doi.org/10.1163/1573-3912_islam_SIM_1422 (Last Accessed: March 19, 2021) First print edition: 1960-2007.

³¹⁶ Marçais, G., “Binā’”, in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. http://dx.doi.org/10.1163/1573-3912_islam_SIM_1422 (Last Accessed: March 19, 2021) First print edition: 1960-2007.

The susceptibility of mud bricks to weathering agents determined the loss, on perhaps a large scale, of structures constructed out of this material.³¹⁷ The production of fired bricks was costly, due to the need for extensive amounts of firing material, in the geographical area where wood was scarce. Monuments constructed out of fired brick therefore reflect the considerable extents of endowments and their prestige. Standard or commonly employed bricks of the Ilkhanid period were square, stemming from a tradition preceding Islamic times.³¹⁸ These bricks varied considerably in their size and colour, and as indicated by their texture, there must have existed multiple production centres for bricks across the Ilkhanid territory.³¹⁹ Moreover, fired bricks of a smaller standard, of half dimensions, compared to common bricks, were characteristic of the Seljuq period and have seldom been employed for Ilkhanid monuments.³²⁰ Cut fired bricks were frequently employed in Ilkhanid monuments, and they feature elaborate bonding patterns; their form must have been determined by additional cutting, which was performed on wet bricks upon their moulding and prior to their drying and firing.³²¹ Moulded fired bricks were employed only in a limited number of Ilkhanid monuments; they were produced in specifically formed moulds and employed for specific parts of the monument structures, for example for the edges of recessed panels or angle colonnettes.³²² These bricks were frequently employed in conjunction with particular forms of moulded bricks and it is likely that they were produced locally and specifically for monuments according to their plans and design.³²³

The colour and texture of Ilkhanid fired bricks varied greatly, likely because they were produced in different locations out of locally available material.³²⁴ This is not dissimilar to the stucco bodies of the Ilkhanid period, where each region features a different colour shade. Wilber notes that they were fired well, but frequently firing was not entirely uniform.³²⁵ Research by Hamed Sayyadshahri provides further evidence concerning fired bricks for monumental constructions being produced locally, such as in the case of the Farumad Friday mosque (Cat. No. 16).³²⁶ Local production of fired bricks, where raw material was present, is a pragmatic solution which reduced the costs of the building material. Mud bricks were used in three different manners: structures built entirely out of mud bricks, structures with mud brick walls and fired brick domes, or structures with wall cores built out of mud bricks dressed in fired bricks (especially frequent in the fourteenth century).³²⁷ Brick reuse was widely practiced in Ilkhanid Iran and it seems that older monuments were deliberately destroyed for the purpose of reusing their construction material.³²⁸

In the sector of the construction of buildings with fired bricks there existed different roles of builders: brick maker, bricklayer, brick-cutter and layer of ornamental brick.³²⁹ The procedure of producing fired bricks can be described in the following manner.³³⁰ Carefully chosen sand

³¹⁷ Wilber notes that the survival rate of mud brick structures must be considerably lower compared to those which were constructed out of fired brick.

³¹⁸ Wilber 1955, 47.

³¹⁹ Wilber 1955, 47-48.

³²⁰ *Ibid.*, 48.

³²¹ *Ibid.*, 48.

³²² *Ibid.*, 48.

³²³ *Ibid.*, 48.

³²⁴ *Ibid.*, 48.

³²⁵ *Ibid.*, 48.

³²⁶ Sayyadshahri 2014, 60, 79.

³²⁷ Wilber 1955, 49.

³²⁸ *Ibid.*, 49.

³²⁹ Lewcock 1984, 136.

³³⁰ Summary from: Lewcock 1984, 136-137.

and clay were soaked for one day before their moulding. Moulded bricks would be made on a grey sand bed and dried twice as long as adobe bricks (for some days). They would be fired for three days in a kiln for brick firing. These fired bricks would be bound with gypsum mortar, or for water or damp exposed structures, lime and sand mortar would be employed.

Information on the types of brick joints is provided by Wilber.³³¹ There existed three main types of brick joints for the Ilkhanid monuments which stem from the long-standing tradition of monument construction in the Iranian territory and are not an Ilkhanid inventions. The first type comprises the placing of bricks to form rising and horizontal joints of approximate 2 cm width. The second type comprises a combination of horizontal joints amounting to a width of 2 or more centimetres, and rising joints of minimal thickness. The third type comprises the construction of supporting walls with inserted carved or stamped stucco plugs or glazed elements; horizontal joints are of minimal width and rising joints amount to 2 to 6 cm width into which the plugs were inserted.

Wilber proposes some data concerning the manner of pointing.³³² Two types of brick laying have been discerned. In some cases bricks were placed on a full bed of mortar for the mortar to fill the joints between the bricks and be flush with the surface of the supporting walls. In the other cases, fired bricks were placed onto surfaces covered with a restrained amount of mortar, which determined the wall surfaces to have raked joints. Upon the construction of the supporting walls, often the joints between bricks had to be pointed; most commonly flush pointing was performed or raked joints were made, which could vary from slightly indented to having a depth of two and a half centimetres. Wilber also records one example of a beaded joint at the Gunbad-i Ghaffariyya (1328)³³³ in Maragha, and in a limited number of cases a line was incised into completed joints or joints were coloured white.³³⁴

Among Islamic monuments, the first recorded use of patterned brickwork is documented in the Ukhaydir palace (772) in the region of Karbala and al-Najaf.³³⁵ One of the early masterpieces of the bricklaying art is the Samanid mausoleum in Bukhara (913-43).³³⁶ In the Seljuq period, innovations and developments in regards to brick laying took place. Bricks could be placed in projecting and receding manner to increase the shadow and light effect of decorative patterns and inscriptions. For the first time, bricks were placed to form gaps which were filled with stamped or carved stucco plugs. These techniques of producing architectural revetments at the time of the monument construction developed further in the Ilkhanid period. The Ilkhanid craftsmen and builders began to frequently employ laying of bricks combined with insertion of glazed elements into gaps. In this manner, they could produce monumental inscriptions or abstract geometric patterns. The art of brick plugs developed into a new technique which was not tied to the laying of the bricks, but which comprised the covering of architectural surfaces with a layer of gypsum onto which plugs were carved to either form abstract decorative patterns or repeating inscriptions in *Khatt-i banna'i* style. The described technique was especially useful

³³¹ Summary from: Wilber 1955, 49.

³³² Summary from: Wilber 1955, 49-50.

³³³ Wilber 1955, 171-172; https://archnet.org/sites/1638/media_contents/1057 (Last Accessed: April 15, 2021).

³³⁴ Wilber notes that false joint lines and false bonding patterns, which were produced by incision on a layer of plaster have been employed extensively in Ilkhanid period. This practice is discussed in the section concerning types of stucco plugs.

³³⁵ Reuther 1912; Creswell 1989, 248-58.

³³⁶ Chmelnitzkij 1992, 125-140; Stock 1989-91.

for decoration of existing wall structures which were redecorated in interventions separate to their construction.

Wilber provides detailed information concerning brick bonding patterns of the Ilkhanid construction practices.³³⁷ Bonding in the Ilkhanid period was limited to a restricted number of patterns, which show differences in surface treatment and size of their units. These patterns could be achieved in three ways: by uniform wall surface plane with rising and horizontal joints of similar widths, by use of wider rising joints filled with recessed or projecting elements (stucco plugs, glazed elements, etc.) or by use of wider rising joints filled to form a unified visual plane with fired bricks, or by insertion of glazed or gypsum elements (plugs). Compared to Seljuq period, in which elaborate patterns of revetments were formed in these ways, there existed a lesser variety of inserted ornamental elements during Ilkhanid times, when insertion of glazed elements was invented. These procedures of revetting the supporting walls fell out of use in the post-Ilkhanid period, on the account of the spread of tile mosaic and other glazed revetments. In describing these patterns, Wilber divides them into the following groups: common bond, doubled common bond and diagonal square pattern, sacred names or phrases, strapwork pattern, chevron pattern and herringbone pattern.

b.) Masonry Techniques - Clay Walling

Clay walling, pisé, cobwork, or rammed earth, was occasionally employed for construction of the Ilkhanid monuments or their parts. In some cases, such as the Gar Friday mosque (Cat. No. 7), or the Haftshuya Friday mosque (Cat. No. 3), the technique was combined with adobe brick structure and fired brick constructed parts of buildings. The technology for clay walling is described by Ibn Khaldun, but it varies according to the region. The technique was used to build coarse supporting walls of the monuments and it did not include use of bricks. Instead, walls were formed by use of moulding boards and shuttering, which were filled with earth mixed with quicklime. When the material set, the procedure was continued in the same manner, in several segments. Alternatively, no boards were employed and packed clay was laid in high courses, which had to dry before the application of subsequent layers. For such walls, material was composed out of a mixture of sand, straw and chaff, mixed with water, soaked for two days and formed into mud balls ready to form the walls, which had to dry for at least two days.

c.) Masonry Techniques – Stonework

Stone material was employed infrequently for the construction of the Ilkhanid monuments, due to its scarcity in the given geographical area. More often, monuments were built out of fired or adobe brick. There nevertheless exist some Ilkhanid monuments which were built with stone material of different kinds.³³⁸ Furthermore, stone material was employed for the construction of the foundations of larger dimensioned monuments, such as the Uljaytu mausoleum at Sultaniyya (Cat. No. 27).³³⁹ It is not clear whether in Ilkhanid Iran there existed a single craft

³³⁷ Wilber 1955, 50-51.

³³⁸ The Pir-i Bakran mausoleum (Cat. No. 2) was built out of roughly shaped cut stone, which was found in abundance near the location. The Shaykh Yusuf Sarvistani mausoleum at Sarvistan (late 13th century) was also constructed out of cut stone and it featured finely worked entrance portals in stone. The most extensive complex in stone medium is the Pir Husayn Khanqah at Qubalibalaoğlu (Cat. No. 28), which is built out of finely worked stone blocks and featured as a series of inscription slabs on its architectural surfaces. It was the work of the local tradition of the given geographical area.

³³⁹ From the plan of Sultaniyya and its foundations. Plan no. 12. Progetto di restauro del mausoleo di Olgieitu a Soltanieh. Prof. Ing. Arch. Piero Sanpaulesi with collaborator Dr. Arch. Reza Kassai. Courtesy of the ICHHTO office at Sultaniyya.

of stonemasonry or if it was divided into specialized crafts, such as quarry men, shapers of stones at the construction site, men preparing roughly cut stone for the foundations of monuments, men preparing finely cut stone for the monument walls and specialized stone carvers for stone ornamentation and inscriptions.

Evidence of specialized stone carvers is found on late thirteenth and early fourteenth century tombstones in the area of Kazirun, which were produced by three generations of a family of stone carvers, during at least four decades of their stonemasonry activity (between 1264 and 1301).³⁴⁰ These signatures provide additional evidence in favour of the proposed hypotheses that training and transfer of specialized craftsmen's knowledge frequently occurred within a family circle of a certain profession. This is similar to the case of the Damghani stucco craftsmen in the Ilkhanid period. Further evidence from signatures, indicating different roles and expertise in the sector of stonemasonry, has been documented on the carved stone slabs of the Pir Husayn Khanqah at Qubalibalaoğlan (Cat. No. 25), where the two double signatures from the thirteenth to fourteenth centuries reflect the presence of architects, master stonemasons and stone carvers at the construction site of the monumental *khanqah* complex. Salaries of stonemasonry craftsmen were likely estimated based on the amount of performed work, but there exists no solid or detailed evidence concerning the characteristics of these practices, except for some cases of masonry marks on worked stones. One of the most significant Ilkhanid monuments featuring elaborate carved stone portals and tombstones is the Funerary complex of Shaykh Yusuf Sarvistani (1281, 1283, 1314, 1316, 1349)³⁴¹ in Sarvistan.

Dressed Stone

Wilber lists ten monuments where dressed stone was employed in their construction.³⁴² He notes that these monuments are all located in north-western Iran and in the Caucasus, and that they date between 1300 and 1333. It thus seems that the use of this construction material for Ilkhanid monuments depended on the availability of the material and perhaps local building tradition, which was determined by the builders' workshops, which operated in different regions of the Empire. In the documented cases, the employed stone material varies from sandstone, limestone and close-grained grey-green stone. Cut stone is employed for lower parts of structures, which form the bases of the monuments but not for their entire structures; dimensions of blocks vary considerably, but the majority of blocks amounts to 1,5 by 0,7 m. Some of these monuments retain stone portals and in one case the floor was built out of stone slabs. Wilber also documents marks of masons on cut stone of two monuments.³⁴³ Another important structure built out of cut stone is the shrine in the centre of the courtyard of the Shiraz Friday mosque, dated 1351.³⁴⁴

Rubble Masonry

Wilber provides some information concerning the construction of monuments out of rubble masonry, stating that it is was rarely employed for monument construction during Ilkhanid

³⁴⁰ Compare: TEI 38803, 38821, 38767, 38825, 38753, 38769, 38831 (Last Accessed: December 11, 2021).

³⁴¹ Wilber 1955, 117; <https://archnet.org/sites/5498> (Last Accessed: April 15, 2021).

³⁴² Wilber 1955, 51.

³⁴³ Compare to Harvey 1973, 47.

³⁴⁴ It was built out of rubble masonry and coated with finely worked stone slabs. It also comprises columns with finely carved capitals, blind niches, muqarnas hoods and a monumental stone inscription with the background filled with floral scroll in tile mosaic, which is a unique decorative technique, not documented on other monuments.

times.³⁴⁵ In fact, the only rubble masonry constructed monument documented by Wilber is the Pir-i Bakran mausoleum (Cat. No. 2) near Isfahan. Research of this monument illustrates that it was likely built out of rubble masonry material, because it abounded in the mausoleum's immediate surroundings.³⁴⁶ Another monument, no longer extant, is the Alaki caravanserai near Marand; it was constructed out of fired bricks, which were occasionally combined with rubble material.³⁴⁷

d.) Binding Agents

Absence of systematic research on binding agents, for the construction of the Ilkhanid monuments does not allow for a precise statement on Ilkhanid practices of mortar preparation. Judging from the wider context of the monument construction sector in the Islamic realm³⁴⁸ it seems that gypsum composed mortar prevailed over lime mortar (which was more demanding to produce). Wilber proposes that gypsum mortar (plaster of Paris) was preferred over lime mortar, because it would set in a shorter time, which aided the construction of vaultings and arches.³⁴⁹ Moreover, for the mortar, gypsum was often mixed with clay, sand, fine gravel and occasionally mud.³⁵⁰ It varied in hardness, from soft to very hard, and in colour from white to light buff and up to grey.³⁵¹ Wilber notes that in some monuments the colour of the mortar consciously copied the colour of bricks.³⁵² This is due to the local origin of construction material and it is confirmed by research of material sources for fired bricks and terracotta of the Farumad Friday mosque (Cat. No. 16) by Sayyadshahri.³⁵³

e.) Plastering

Plasters and mortars could be produced out of lime or gypsum material. Both first had to be quarried and they subsequently needed to be burnt. The burning of gypsum was less costly as it needed lower temperatures than lime. The burning of lime and mortar were mostly two separate crafts.³⁵⁴ In both cases, gypsum rock, limestone, or shells, were loaded into an open kiln and fired for twelve to twenty-four hours, followed by the cooling process.³⁵⁵ After firing, lime could be immediately used by the builders, but gypsum rock had to first be crushed into powder in a vertical stone mill.³⁵⁶ In his description of house construction, Chardin provides some information concerning gypsum, stating that the gypsum was different to the European one; more coarse and not white.³⁵⁷ The cost of lime was higher, compared to gypsum and it was

³⁴⁵ Wilber 1955, 52.

³⁴⁶ Wilber notes that the vault of the original *iwan* structure of the mausoleum was also built in rubble, that it collapsed shortly after and that it was rebuilt in fired brick.

³⁴⁷ Moradi and Omrani 2014. See also photographs by Blair and Bloom, IMG11279: https://archnet.org/sites/5475/media_contents/42415 (Last Accessed: April 16, 2021).

³⁴⁸ Lewcock 1984, 134.

³⁴⁹ Wilber 1955, 49.

³⁵⁰ *Ibid.*, 49.

³⁵¹ *Ibid.*, 49.

³⁵² *Ibid.*, 49.

³⁵³ Sayyadshahri 2014, 60, 79.

³⁵⁴ Lewcock 1984, 138-139.

³⁵⁵ *Ibid.*, 139.

³⁵⁶ *Ibid.*, 139.

³⁵⁷ It would be quarried, fired, pounded and ground with a mill-stone of specific dimensions. It is significant that it was peasants who produced plaster and that it was produced in the cold months of the year, when there was no work in the fields. There also existed quarries of limestone. The description provides evidence of division of work between the sectors of production of monument construction material and the activities of construction site. Ferrier 1996, 168.

employed selectively, especially for mortars in damp conditions, covering of roofs and also as decorative revetment. Gypsum could also constitute the main component of mortars, but it was also the main material for the production of stucco body for carved stuccos.

f.) Carpentry

There is limited information concerning carpentry practices tied to the construction of Ilkhanid monuments, due to the lack of written sources and an only small amount of preserved wood material. Wilber notes that in the seven Ilkhanid monuments he examined, wood was employed in a structural or semi-structural manner, but that perhaps more monuments comprise wood in their structures which is not visible due to being hidden inside the integral structure.³⁵⁸ The most widespread tree species in the Iranian territory are the poplar and a type of plane tree. But based on his examinations, Wilber proposes that for monument building, either walnut or oak were employed, and that it is likely that the wood had to be imported from distant locations. Two specific aspects of woodworking can be singled out in respect to the monument construction: carpentry for the construction of monuments, especially tied to scaffolding construction, and carpentry for the production of monument furniture.

The most significant role of carpentry for monument construction was the construction of wooden scaffolding. Wilber provides some information concerning the evidence of scaffolding from his documentation of monuments.³⁵⁹ Beams forming the scaffolding were inserted into the supporting walls of monuments during monument construction. Wilber mentions that the dimensions of scaffold holes in supporting walls of the monuments range between 9 and 15 cm, and some 40 cm deep and they do not pierce walls entirely. Scaffold holes are found on all the walls of the monuments (on their interior and exterior surfaces), which indicates their threefold function: delivery of construction material, working platform for monument construction, and working platform for production and application of architectural revetments. Wilber notes that in some monuments, scaffolding was employed only in their interior. According to Wilber, it is plausible that the craftsmen who produced the stucco revetments also employed self-standing scaffold systems for revetments such as monumental mihrabs.³⁶⁰

This research paid specific attention to this aspect of monument construction for which it provides numerous examples from different structures. The evidence is above all contained in the remains of scaffolding in the supporting walls of buildings. These scaffolding remains are parts of beams in the supporting walls, which remained in position once the scaffolding was removed by sawing it off. The most significant findings regarding monument scaffolding concern the research of scaffolding remains at the Uljaytu mausoleum at Sultaniyya (Cat. No. 27). Remains of scaffolding in the wall penetrate both layers of architectural revetments in the interior of the mausoleum's octagonal core, which are works of two decorative interventions (1305-1310-1316/20). These scaffolding remains indicate that both decorative interventions in the monument were performed using the same scaffolding structure; this also implies that the break between the two decorative phases had to be very short, if there actually was any break at all (otherwise the scaffolding would have been removed and would have had to be built anew).

³⁵⁸ Wilber 1955, 52.

³⁵⁹ Summary from: *Ibid.*, 54-55.

³⁶⁰ *Ibid.*, 56.

The need of the builders and craftsmen to employ scaffolding for monument construction and decoration meant a close collaboration between the monument builders, carpenters and revetment workshops. In monuments such as the Imamzada ‘Abdullah at Gudzar (Seljuq or Ilkhanid) or the Gunbad-i ‘Alawiyan in Hamedan (Seljuq),³⁶¹ the research of scaffolding remains indicates that the carved stucco revetments of these two monuments are contemporaneous to the time of the monument construction and are not works of subsequent redecoration campaigns. Often, remains of scaffolding were not meant to be concealed from the viewer, as indicated by the case of the Taj al-Mulk domed chamber in the Isfahan Friday mosque, where they protrude considerably from the decorated surfaces of dome’s interior.

Wilber also explains that the timbers would be embedded into architectural structures of monuments to make them more earthquake-resistant and to ease the setting of built structures. He explains that the evidence at the Dashti Friday mosque near Isfahan indicates that timbers were embedded into the walls below the transitional zones in order to form a chain, which would bind together the base of the dome and prevent vertical cracks in walls. Timbers were probably embedded into the Ilkhanid structures at different heights and for diverse purposes. Further information could only be retrieved by opening the walls. Wooden pieces could also be employed to support parts of the monumental structures. Wooden beams were embedded into the walls of the Argh-i ‘Ali Shah in Tabriz (actually a mausoleum), in order to increase their stability. At the Varamin Friday mosque (Cat. No. 28), wooden elements are employed to reinforce and form the muqarnas hood structure of the entrance portal. Squared timbers were employed for the entrance portal of the Sin caravanserai and to carry the squinches of the domed chamber of the Herat Friday mosque. In his discussion of Sultaniyya, Wilber draws on publications by Godard and sustains that its dome is supported by a wooden ring of beams.³⁶² This has been proved erroneous through a detailed examination of the monument’s structure by Brambilla, indicating that the double shelled dome of the monument is braced by arches.³⁶³

Worked wood material was also employed for the production of stucco revetments. Shorter and smaller wooden pegs were documented during this research on some stucco panels and the mihrab of the Pir-i Bakran mausoleum (Cat. No. 2) and some stucco panels and the mihrab of the Farumad Friday mosque (Cat. No. 16). It is not clear if wooden pegs were employed on purpose or due to their specific material characteristics, or if they were a substitution for more costly iron nails.

Other aspect of wood use in the context of the monuments concern their furniture. Examples of Ilkhanid period minbars, such as the undated Ilkhanid minbar in the Isfahan Friday mosque (now flanking the Uljaytu mihrab; Cat. No. 1) and the 1311-12 monumental wooden minbar of the Na’in Friday mosque, reflect the pinnacle of Ilkhanid woodcarving craft. The Na’in minbar is signed by a Kirmani master (*ustad*) and its calligrapher, or the person responsible for its design, indicating work division within the workshop of Ilkhanid woodcarving.³⁶⁴ Another important example is provided by the post-Ilkhanid Qur’an stand, now in the Metropolitan museum of Art in New York (Inv. No 10.218, dated 1360, signed; *work of Hasan ibn-i Zayn*

³⁶¹ Shani 1996; <https://archnet.org/sites/1610> (Last Accessed: April 16, 2021).

³⁶² Wilber 1955, 139-141.

³⁶³ Brambilla and Moradi, The Mausoleum of Ali-Shah; Fifty Years of Misunderstanding, paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

³⁶⁴ Smith 1938.

ibn-i Sulayman al-Isfahani, produced for the Sadrabad Madrasa in Anar³⁶⁵), which displays a superb design, wooden inlay and woodcarving work. In addition to the listed examples of monument furniture, carpenters also had to produce doors for numerous monuments, some of which are signed. One of the few examples of Ilkhanid woodwork are the pair of carved doors of the Gunbad structure at the Turbat-i Jam complex (Cat. No. 30). A rare case of a wooden mihrab, which might date to the Ilkhanid and earlier periods, at the Abyana Friday mosque, indicates other types of woodwork in the medieval Iranian territory. Woodcarver inscriptions with signatures from the Timurid period, especially from monuments in the Caspian area, indicate that woodcarving apprenticeship seems to have functioned in a manner similar to the art of carved stucco, within workshops, and that it was often performed among members of the same family.³⁶⁶

g.) Metalworking

For monument construction and the production of architectural revetments specially produced iron items were needed. In larger settlements and for more extensive commissions, a specialised smith produced the necessary nails, bolts, hinges, catches, knockers, locks and grills.³⁶⁷ All these metal items were of essential significance for the construction of monuments in Ilkhanid period. For more important commissions, locks, knockers and grills would assume more elaborate artistic forms. Moreover, Wilber notes that the evidence from the Sin caravanserai (no longer extant) indicates that iron elements were employed to strengthen junctions between embedded timbers in its structure.³⁶⁸ For the production of stuccos, this research indicates that nails of diverse sizes were commonly employed as a part of the stucco production process. It has been shown that for the consolidation and increased adhesion of stucco layers of the Uljaytu mihrab (Cat. No. 1), around 10 to 11 cm long iron nails were inserted into its stucco core. Small iron nails were employed in a great number to fix the second decorative repertoire of the Uljaytu mausoleum (Cat. No. 27) onto its interior architectural surfaces.

Numerous tools employed by stucco craftsmen for stucco production were also mainly produced out of metal. It however remains unclear whether stucco craftsmen produced these tools by themselves, with the aid of metalworkers or if they ordered them from the metalworkers. The discerned difference in use of tools between stuccos made by different workshops indicates that there seems not to have existed a *standardized stucco working tool set*, and that stucco craftsmen themselves were likely responsible for tool design and for the production of tools. This determined innovations of different approaches to stucco carving and diverse stucco artistic techniques which were likely connected to use of specific stucco working tools. A good example is the stucco undercut artistic technique, which was widespread in the Isfahan area; it required specific tools, which enabled the craftsmen to carve stucco at a specific angle, leading to the production of the undercut. The diversity of tools employed by different craftsmen's workshops is also reflected in the variety of types of stucco perforation, forms of which depended on the availability of different tools.

³⁶⁵ The location of this settlement remains unknown. The stand was produced in Iran or Central Asia. <https://www.metmuseum.org/art/collection/search/446151?searchField=All&sortBy=Relevance&ft=quaran+stand&offset=0&rpp=20&pos=1> (Last Accessed: March 17, 2021).

³⁶⁶ See Aube 2021.

³⁶⁷ Lewcock 1984, 138.

³⁶⁸ Wilber 1955, 53.

h.) Building Equipment and Machinery

There are no primary written sources or archaeological evidence concerning the building equipment and machinery for the construction of Ilkhanid monuments. Some information can be extrapolated from the contemporary writings of Ibn Khaldun (14th century), and from considerably earlier writings of Aristotle, Archimedes and Hero.³⁶⁹ Large-scale projects, such as the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) could have necessitated machinery for rightening the walls and to ease the transport of construction material into its upper storeys. Chardin, in the seventeenth century, provides a drawing of a pulley, which he explains is one of the mechanisms employed in the construction of large monuments.³⁷⁰ He also states that apart from pulleys, builders did not use any other mechanisms for monument construction, because the pulley served all purposes.

2.4 Architectural Elements of Ilkhanid Monuments

a.) Foundations

There exists only limited information concerning the characteristics of Ilkhanid monument foundations, due to the lack of archaeological excavations or publication of the results of the excavations. Monument foundations were built out of stone where it was available, which could reach up to half a meter in height, above ground level.³⁷¹ This was rough work and employed material varied from roughly shaped stone, rough rubble or river boulders; for prestigious commissions, walls were coated in finely worked ashlar. For the Ilkhanid period, some evidence is provided by the 1970s soundings of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) by the Italo-Iranian research team. Foundations of this imperial commission and large dimension monument are surprisingly shallow and amount to some 3 meters of depth and only half a meter underground.³⁷² These foundations comprised a layer of white soil on their bottom, which was followed by a layer of river boulders and topped by a layer of green stone.³⁷³ But these foundations did not extend beyond the ground level, where the mausoleum's supporting walls were built out of fired bricks. This might indicate that the 11 m deep foundations of the Gunbad-i Qabus funerary tower (1006-1007),³⁷⁴ might have been determined by the trial and error approach of its builders.³⁷⁵

³⁶⁹ Lewcock 1984, 140-141.

³⁷⁰ Ferrier 1996, 170-71.

³⁷¹ Lewcock 1984, 134.

³⁷² From the plan of Sultaniyya and its foundations. Plan no. 12. Progetto di restauro del mausoleo di Olgieitu a Soltanieh. Prof. Ing. Arch. Piero Sanpaulesi with collaborator Dr. Arch. Reza Kassai. Courtesy of the ICHHTO office at Sultaniyya.

³⁷³ *Ibid.*

³⁷⁴ Lewcock 1984, 134; Pope and Ackermann 1977[1938-39], Vol. 3, 967-974; <https://www.archnet.org/sites/1606> (Last Accessed: December 2, 2021).

³⁷⁵ Builders could have made foundations as deep as possible for the tower to remain in place. Seeing as this is a monument of unprecedented dimensions, the depth of foundation could have been roughly estimated and made deeper than necessary for the tower not to collapse.

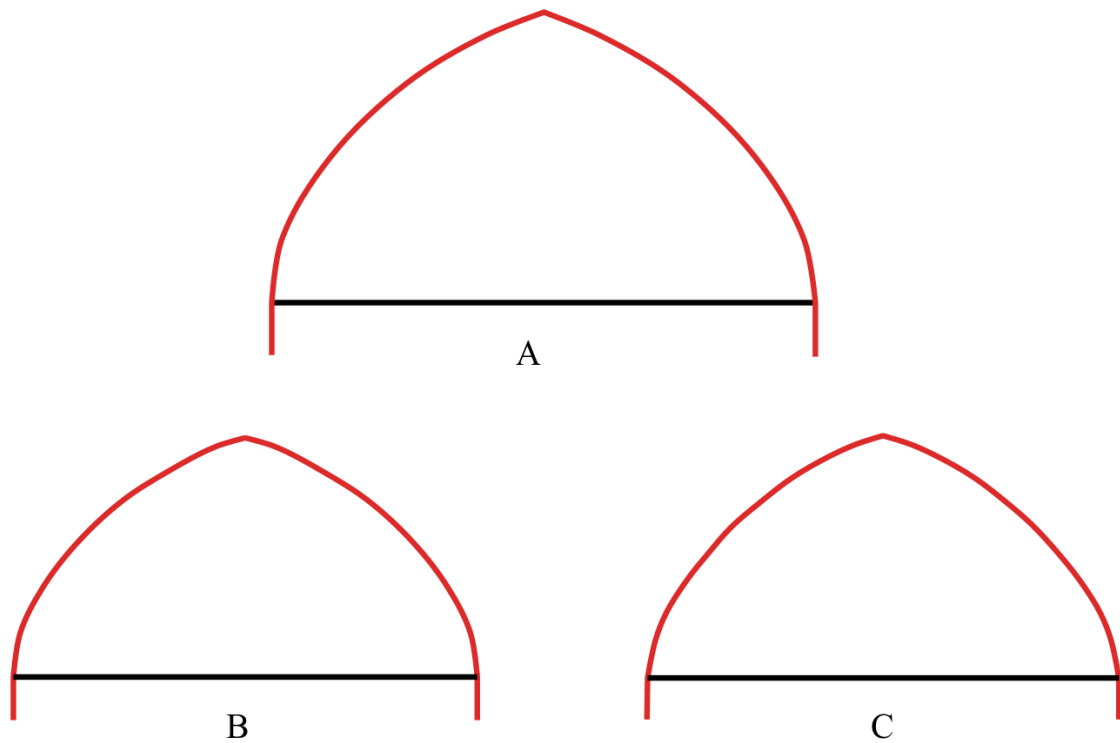


Figure 11: Schematic drawing of three variants of pointed arch which were frequently employed in the Ilkhanid monuments. (After Wilber 1955, 68-69.)

b.) Arches

Figs. 11-13.

The formative period of the development of types of arches in Islamic architecture goes back to the ninth century. The earliest arches were semi-circular, pointed, horseshoe (semi-circular or pointed form), trefoil and multifoil (or cusped arch, it could be two or four-cantered), stilted (semi-circular or, and pointed form) and corbelled and ogee (notched) arch.³⁷⁶ One of the early timber-tie rod systems to strengthen arches is documented in the mosque of 'Amr in Cairo (673);³⁷⁷ it was frequently employed to reinforce architectural structures of hypostyle halls in the Iranian territory, Ilkhanid period included. Wilber provides some information concerning the use of types of arches in Ilkhanid monuments.³⁷⁸ According to the monument analysis by Wilber, the arches mainly sprung from projecting offsets. An extensive number of monuments displays a considerable variety in arch profiles. But these variations seem to have been performed with a relative degree of accuracy which confirms the use of forming boards for arch profiles. Arch profile variation was also employed for decorative purposes. One of the most frequently employed arches was the pointed arch. It was followed by the segmental arch, which was infrequently employed in Seljuq times, but in the Ilkhanid period it was commonly used. Another type of employed arch form was the arch with a flat head. Occasionally, a double reverse curve was used for decorative purposes. The segmental arch was also frequently used.

³⁷⁶ Lewcock 1984, 136. For use of these types of arches in early Islamic architecture, see Creswell 1989.

³⁷⁷ Lewcock 1984, 136.

³⁷⁸ Summary from: Wilber 1955, 68-71.

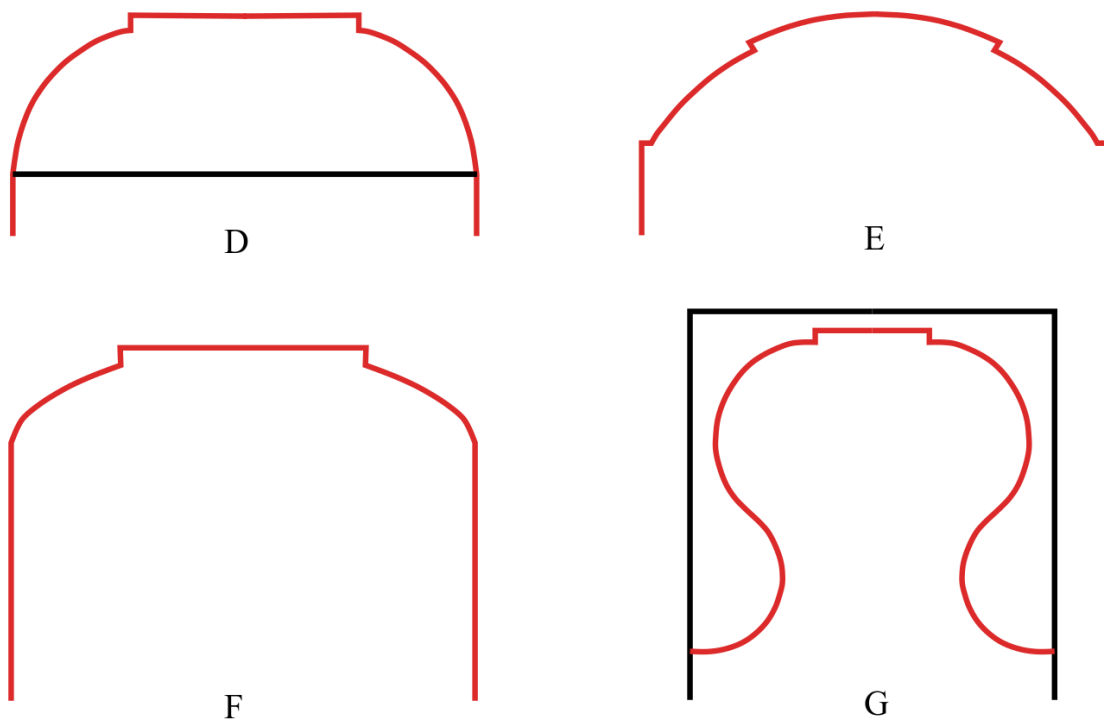


Figure 12: Diverse types of shouldered arches in Ilkhanid monuments. (After Wilber 1955, 70-71.)

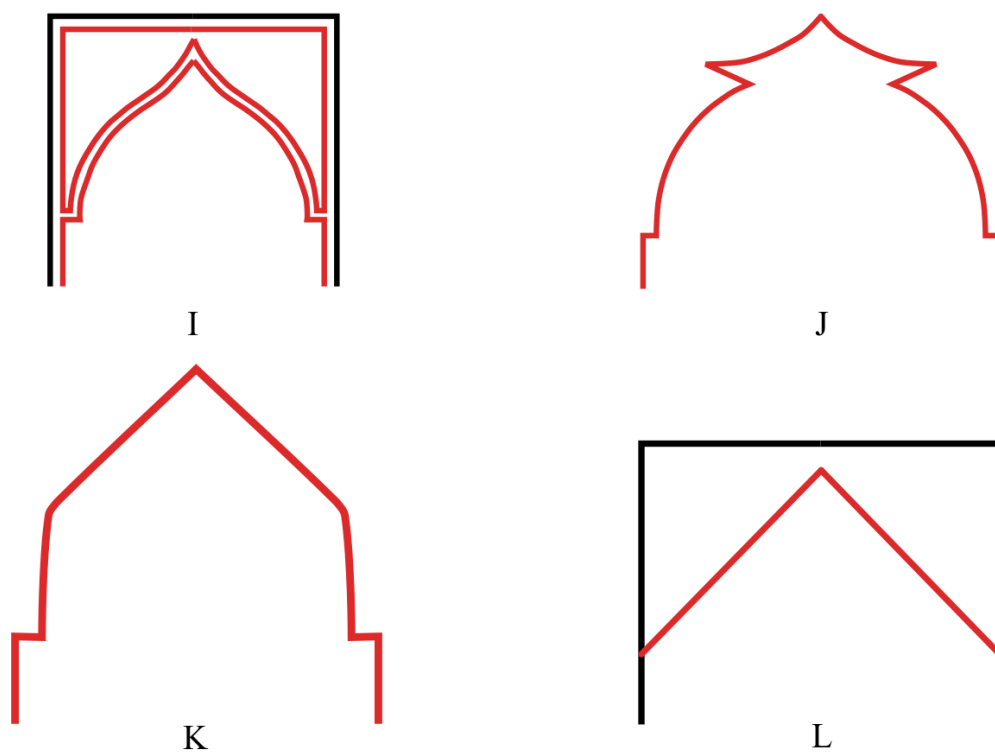


Figure 13: Various types of pointed shouldered arches in Ilkhanid monuments. (After Wilber 1955, 71.)

c.) Columns, Pillars and Piers

Columns, pillars and piers are essential architectural elements of Ilkhanid monuments. Two modalities of their use can be discerned: structural and non-structural. They were essential for construction and support of hypostyle prayer halls in the monuments, especially mosques, madrasas and caravanserais. For Ilkhanid hypostyle structures, columns with a square base were most frequently employed and columns were used only infrequently and in a few cases. Columns and piers of slender form were also employed to visually break down architectural surfaces of monuments, especially for interiors of domed prayer halls or interiors of mausolea with diverse ground plans. They were partially integrated into the wall surfaces, at regular intervals, and often alternated with blind niches.³⁷⁹ These two described modalities of use of these architectural elements were already in use in the Seljuq period when they were more elaborate and featured a greater variety of forms.

d.) Squinches and Transitional Zones

For transitional zones between supporting walls and the domes, Ilkhanid builders continued to employ sets of devices which were in frequent use in Seljuq times.³⁸⁰ Corner squinch arches were placed on the corners of square structures in order to form octagonal drums on which the domes were built. The octagon would have been topped by a sixteen-sided architectural form, determined by the use of wall arches, such as in the case of the Varamin Friday mosque (Cat. No. 28), the Ushturjan Friday mosque (Cat. No. 4) and Friday mosques of Kaj and Azadan.³⁸¹ Alternatively, sets of smaller squinches would top corner arches in order to form the drum for the monumental domes.

Wilber provides information concerning the use of squinches.³⁸² Use of squinch elements for transition between square structures of monuments and the domes has a long-standing tradition in the Iranian territory and it dates back to Sassanid times. Corner angles of the square structures were topped by corner arches, which formed squinches, which carried the majority of the weight of the dome. The space between the four corner arches would take on a minimum of the dome's weight which enabled the construction of window openings in these areas. These transitional zone elements were frequently decorated with blind niches of dimensions corresponding to the corner arches and with panels of architectural revetments. Corner-arch squinches could be also covered with architectural revetments of different types, including muqarnas, which began to be employed for squinch areas in Seljuq period.³⁸³ But muqarnas were also used in earlier periods and across the majority of Islamic lands.

e.) Stairs

Wilber informs that all the staircases of the Ilkhanid minarets rotate in spirals in their interiors and connect the interior minaret core with the exterior shell.³⁸⁴ In some monuments, Wilber documents interior staircases, which were built within the monument structure; these staircases are in some cases spiral and in other cases straight flights of stairs. He notes that the main

³⁷⁹ One of the best examples is presented by the stucco columns and blind niches in the interior of the shrine of 'Abd al-Samad in Natanz (Cat. No. 12). Elaborate compositions of architectural surfaces were also achieved in the interiors and exteriors of mausolea of Bagh-i Sabz in Qum (Cat. No. 15).

³⁸⁰ Wilber 1955, 62.

³⁸¹ *Ibid.*, 63.

³⁸² *Ibid.*, 72-74.

³⁸³ *Ibid.*, 72.

³⁸⁴ *Ibid.*, 56.

purpose of the stairs was maintenance, but fails to note that in some cases staircases could partially substitute scaffolding and thus reduce the amount of wood needed for the scaffolding construction.

f.) Muqarnas

Muqarnas³⁸⁵ is a non-structural element, and it is employed as a type of architectural revetment, which is located within concave architectural elements, such as corner arches, semi-domes or domes. It can be produced in diverse architectural revetment media, which range from a combination of terracotta and carved stucco, to carved stucco, tile mosaic, wall painting or other media. Different solutions for the construction of muqarnas and its application on architectural structures developed through centuries of its use. Muqarnas consists of several tiers of cells formed by combinations of small dimension quarter domes (or other elements) and convex brackets, with each upper tier projecting forward from the lower tiers. It is the outstanding architectural element of Islamic architecture in the majority of Islamic lands and across an extensive chronological span.

Wilber explains that muqarnas were frequently employed during the Seljuq period, but that in the Ilkhanid period, forms of muqarnas were further elaborated and employed in an increased variety of ways (for cornices, capitals, half-domes and domes).³⁸⁶ The complex geometry of muqarnas forms and their production could have been simplified with practices similar to those of the modern Maghreb and Iraq, which comprise use of sets of standard wood form strips, and which can be combined into a variety of diverse brackets for muqarnas compositions.³⁸⁷ Evidence concerning the production of muqarnas in the Ilkhanid period indicates that craftsmen in charge of muqarnas production worked directly from two-dimensional drawings.

The muqarnas design slab discovered at Takht-i Sulayman (1270s; Fig. 14) features a two-dimensional design of muqarnas and it must have been employed as a working drawing for production of the three-dimensional muqarnas elements.³⁸⁸ Different decoding systems and reconstructions of the muqarnas vault based on the plan on this working drawing incised into the plaster surface have been proposed by Ulrich Harb, Yaghan Muhammad Ali Jalal, and Yvonne Dold-Samplonius and Silvia L. Harmsen.³⁸⁹ They suggest different systems for decoding of the drawing on the stucco plaque and a variety of muqarnas vaults which may have been produced based on the plan. Although it is difficult to conclude which decoding system was employed it is clear that the plaque discovered at Takht-i Sulayman was a working drawing, which was employed by craftsmen to produce different parts of muqarnas and to assemble them into a vault. The plaque is thus one of the earliest extant drawings and plans for production of architectural revetments within the Iranian territory and the Islamic lands. The sophistication of the drawing, as discussed by Harb, Yaghan and Dold-Samplonius and Harmsen, indicates that the plaque reflects an established practice of muqarnas notation, which was likely transmitted between artisans via the apprenticeship, from previous generations of craftsmen. It is thus plausible that the muqarnas plaque reflects a tradition, which considerably pre-dates the Ilkhanid period. According to Bloom, the master builder may have planned the vault of the muqarnas at Takht-i Sulayman first on paper, and subsequently craftsmen produced the plaque

³⁸⁵ See Rosintal 1928; Harb 1978; Tabbaa 1985.

³⁸⁶ Summary from Wilber 1955, 68-71.

³⁸⁷ Wilber 1955, 73.

³⁸⁸ Bloom 2006, 295-296.

³⁸⁹ Harb 1978, 60-66; Yaghan 2000; Dold-Samplonius and Harmsen 2005.

based on the drawing, in a more durable medium, which aided them in assembling the vault during the process of its construction.³⁹⁰

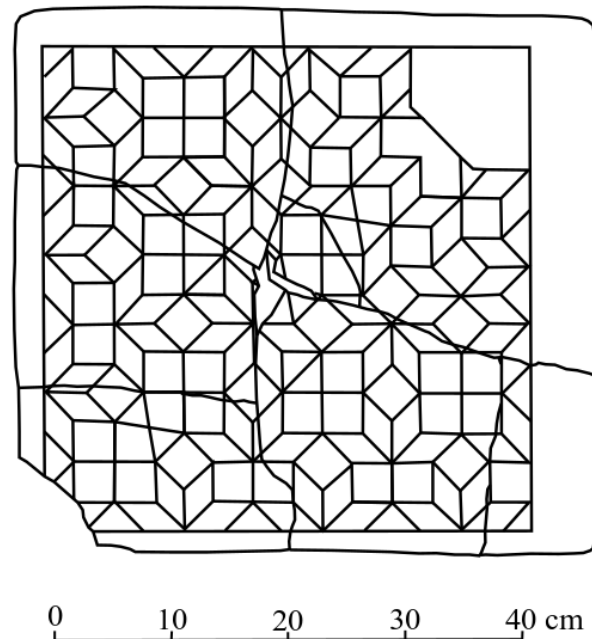


Figure 14: Drawing of the muqarnas slab in stucco discovered at Takht-i Sulayman. (Drawing after Harb 1978, 60).

Wilber highlights the fact that none of the muqarnas are structural and that this is a non-structural element of architectural revetments.³⁹¹ In terms of its application onto architectural surfaces, he distinguishes three types of muqarnas: corbelled, superimposed and suspended.³⁹² The corbeled system comprised production of muqarnas with material related to the architectural structure and bonding of muqarnas into the architectural fabric. This type of muqarnas occurs rather infrequently, because the muqarnas was normally produced as an architectural revetment once the monument construction had been brought to term. Corbeled muqarnas was employed more frequently in the Seljuq period. The superimposed muqarnas was produced by its construction being performed up against and out of concave architectural elements, as determined by the employed material; entire and cut bricks and terracotta. These muqarnas had an inherent cohesion and stability. Suspended muqarnas were produced by their successive tiers being attached to the wall (and hung), in different manners, such as with wooden structures or in later periods also with a rope system. Wilber notes that the muqarnas differed depending on its location on interior or exterior surfaces. The exterior muqarnas were either corbeled or superimposed. Moreover, in Ilkhanid architecture the use of muqarnas for piers was very rare, compared to other Islamic lands. He also notes that lunettes or niches, mihrab niches, squinches, and half-domes were covered with either superimposed or suspended muqarnas. The difference between these two types of muqarnas was that there was no hollow space between the core of the superimposed muqarnas and its revetment coating, compared to

³⁹⁰ Bloom 2006, 295-296. Further evidence indicating that craftsmen of the Iranian territory worked with two-dimensional drawings of muqarnas is provided by the Timurid Topkapı scroll (late 15th century) which comprises numerous drawings of muqarnas.

³⁹¹ Wilber 1955, 73.

³⁹² Summary from: *Ibid.*

the suspended muqarnas which was hollow and only filled with the suspension structure. Some features of the Ilkhanid muqarnas indicate inventions, which were not known in the Seljuq period and which continued to be developed in Timurid times.³⁹³ Among these, the suspended muqarnas produced out of plaster, the white plaster coating for muqarnas, use of straight-sided cells, and frequent use of muqarnas for pyramidal areas are their distinguishing features.

g.) Vaults

Use of fired brick as the main construction material has a long tradition in Iran and Mesopotamia. Perhaps the first peak of fired brick constructions was achieved in Sassanid period (224-651), when numerous innovations and new types of architectural elements, such as the squinch, were implemented.³⁹⁴ The mechanical properties of fired brick (low tensile strength, small dimension, etc.) required architectural forms to be adapted.³⁹⁵ The least demanding forms were arches, vaults and domes.³⁹⁶ Due to the wood shortage, vaults and domes had to be built with minimum centring and shuttering (formwork).³⁹⁷ But despite the mentioned wood material shortage, Ilkhanid monuments in Iran indicate that abundant amounts of wood must have been employed (and re-employed) for scaffoldings (see above).³⁹⁸

The most commonly employed type of vault was the barrel vault, which could be built without formwork or centring.³⁹⁹ In addition to barrel vaults, groined vaults (intersecting barrel vaults) were constructed frequently.⁴⁰⁰ In order to create a flat floor (or the next storey above the vaults), small parallel walls would be built on the top of the vault surface and the spaces between them would be spanned by small brick vaults forming void spaces below the next storey of the structure.⁴⁰¹ A similar system of building hollow walls, with arched structures forming the voids, was employed for the core structure of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27). In this manner, the builders made the structure of the monument lighter, increased its stability and reduced the amount of necessary construction material.

Wilber provides extensive information concerning Ilkhanid vaults.⁴⁰² The system and forms of vault construction of the Ilkhanid period was inherited from Seljuq construction technology and solutions and it does not present any innovations. The exception is the full development of the double-shelled dome, which took place in Ilkhanid times, although this architectural form was extensively in use already during the Seljuq period. Ilkhanid vaults can be divided into the following groups: barrel vaults, vaults over square or rectangular bay, semi-domes and stalactite vaults (muqarnas vaults).⁴⁰³ On their exterior surfaces, vaults could be protected from weathering with a layer of bricks or a mud and straw mixture.⁴⁰⁴ Builders worked to construct

³⁹³ Wilber 1955, 74.

³⁹⁴ See Huff 1993; Huff 1999; Huff 2006; Huff 2008.

³⁹⁵ Lewcock 1984, 141.

³⁹⁶ Lewcock 1984, 141. See also Marçais, G., "Binā", in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. http://dx.doi.org/10.1163/1573-3912_islam_SIM_1422 (Last Accessed: March 19, 2021) First published online: 2012 First print edition: ISBN: 9789004161214, 1960-2007.

³⁹⁷ Lewcock 1984, 141.

³⁹⁸ Perhaps scaffolding systems were more essential for monument constructions compared to centres for centring and wooden forms for shuttering.

³⁹⁹ Lewcock 1984, 141.

⁴⁰⁰ *Ibid.*, 141.

⁴⁰¹ *Ibid.*, 141.

⁴⁰² Wilber 1955, 56-61.

⁴⁰³ Out of these, the muqarnas were non-structural.

⁴⁰⁴ They were not sheeted with lead or tin like in Asia Minor and wooden roof structures were not built.

vaulting systems with a minimum amount of centring and scaffolding. According to Godard, the builders of Sassanid and Islamic Iranian territory employed plaster and reed-made planks, which assumed forms of vaults and aided their construction in a manner similar to moulds. Wilber however emphasizes that a more extensive use of scaffolding and wooden form boards must have been in practice.⁴⁰⁵ Wilber stresses the significance of the use of gypsum mortar for the construction of vaults, which simplified the process, due to its very fast setting, which therefore did not require centring to support the vaults.

Barrel vaults were frequently employed in Ilkhanid monument construction either as simple continuing vaults or in more elaborate manners. This type of vault was also employed in the Seljuq period and earlier times, with their tradition ranging back to the Parthian and Sassanid periods. This type of vault was easy to construct without centring and without intermediary cross arches, which is considered typical of Iranian architecture.⁴⁰⁶ A wall was extended from the rear wall of the *iwan* and fired bricks of the vault were made to lean against it, in an inclined position and the vault was built layer by layer. In other cases, barrel vaults were built through the use of cross arches and they were similar to the vaults built by the form board method. A different method (a variant of a barrel vault) comprised the construction of barrel vaults in a manner in which a rectangular structure was subdivided by a series of cross arches joined to each other by transverse filler vaults of different barrel profiles. A good example of this type of vaulting, which was frequently employed in north-western Iran, are the *iwan* vaults of the 'Abd al-Samad complex mosque (Cat. No. 12).

Vaults which span across square or rectangular structures are of different forms and their construction technology stems from the Seljuq period. Until Seljuq times such structures were covered with barrel vaults. Their disadvantage was the impossibility of forming window openings to let the light into the structures. Accordingly, the use of the barrel vault was substituted in the Seljuq period by a set of domical vaults. Among domical vaults there existed diverse types, forms and a rich decorative fabric for them. Common to the Seljuq and Ilkhanid period were the following types of vaults: groin vaults, cloister vaults, vaults on groin squinches, vaults on reticulated squinches, vaults on triangular squinches, vaults with systems of interlacing armatures, domical vaults, domical lantern vaults, saucer domes and flat vaults. The frequency of use of these vaults was higher in the Seljuq, compared to the Ilkhanid period. Among these, cloister and squinch vaults were frequently employed by Ilkhanid builders. Groin vaults were employed less frequently. Compared to earlier periods, flat vaults, to cover the entrance portals or external galleries, were employed more frequently during the Ilkhanid period.

Wilber suggests that for the construction of vaults, armatures (interpenetrating ribs) must have been put up in order to define their multiple compartments, or for them to provide points from which the muqarnas could be suspended, or to create complex decorative patterns on the interior surfaces of vaults.⁴⁰⁷ These armatures could appear as ribs; they could reduce the torsion and increase the monument's stability to earthquakes. But many vaults did not have such armatures.

⁴⁰⁵ Wilber 1955, 57.

⁴⁰⁶ Lewcock 1984, 115. Chardin also mentions that builders did not make use of centring or scaffolding to build small domes or vaults. Ferrier 1996, 169.

⁴⁰⁷ Wilber 1955, 60.

h.) Half-Domes

Structural half-domes were employed for covering bays or *iwans* which formed entrances to numerous monuments. In order to build half-domes, fired bricks were placed in horizontal courses from the springing to the apex, with slight corbeling. They were built without centring and without form boards. The difference between Seljuq and Ilkhanid vaults was their interior decoration. In the Seljuq period they were decorated with diverse types of brick bonding, but in Ilkhanid times, they began to be coated in plaster into which different decorative patters, such as stucco plugs or other geometrical patterns could be incised and coloured. In the Late Ilkhanid period, smooth white plaster coating became more frequent and it turned into one of the characteristic features of Timurid architecture.

i.) Domes

The Uljaytu mausoleum at Sultaniyya is a monumental example of a dome construction solution which reflects the widespread practice of Ilkhanid dome building, but on a more monumental scale. It is not without precedents: the double-shelled dome structure was frequently employed for the construction of Seljuq monuments and the earliest securely dated double shelled domes pertain to the two mausolea of Kharagan (1067-1068 Eastern tower; 1093-1094 Western tower) near Qazvin.⁴⁰⁸ These monuments demonstrate that the double shelled dome was not an Ilkhanid invention, although it was frequently employed and further developed in the Ilkhanid era. The division of the dome into two separate shells which were interconnected by a system of ribs determined voids within the space between the two shells. In doing so, builders lightened the dome structure, which could damage the monument. Moreover, the exterior dome shell could be rendered monumental, with its form only partially dependent of the interior dome shell. Use of brick ribs by Islamic builders served decorative and structural purposes.⁴⁰⁹ Use of ribs, for example, enabled for the projection of complex decorative patterns onto vaults and domes.⁴¹⁰ Although this was a feature of Seljuq architecture in Iran, it was not employed frequently for Ilkhanid monuments.

Wilber divides Ilkhanid domes into three categories: single domes, true double shelled domes and double shelled domes where the inner dome is concealed by a polyhedral tent dome or a conical roof.⁴¹¹ He documents some twenty-eight Ilkhanid monuments with extant domes and further structures which used to feature domes. Single dome structures were frequently employed in the Seljuq period, but their tradition reaches back to the Sassanid times. The true double shelled dome was already in use in the Seljuq period, with one of the best-known examples being the Sultan Sanjar mausoleum at Marv, dated c. 1157.⁴¹² The monumental example of the inner dome covered by a polyhedral tent dome is presented by the Gunbad-i Qabus, dated 1007.⁴¹³ Wilber proposes ways in which the double shelled dome came to be employed in Ilkhanid architecture.⁴¹⁴ He suggests the following reasons for the double shelled dome in brick formation: copying of wooden double domes into brick masonry, protective wooden domes over brick domes began to be built in brick, double shelled domes were inspired

⁴⁰⁸ Dehkordi 2016; <https://archnet.org/sites/3866> (Last Accessed: April 16, 2021).

⁴⁰⁹ Lewcock 1984, 143.

⁴¹⁰ *Ibid.*, 143.

⁴¹¹ Wilber 1955, 61. Wilber notes that all three dome types were already in use in the Pre-Ilkhanid Iran.

⁴¹² Knobloch 2001, 138; <https://archnet.org/sites/3954> (Last Accessed: April 16, 2021).

⁴¹³ Pope and Ackermann 1977[1938-39], Vol. 3, 967-974; <https://archnet.org/sites/1606> (Last Accessed: April 16, 2021).

⁴¹⁴ Wilber 1955, 63.

by the vault and lantern system of Armenian churches, and conical or polyhedral roofs over interior domes began to be built in brick, and hollow stupas, with double domes, located in Central Asia were copied in brick.⁴¹⁵ These are all valid factors for formation of double shelled brick dome, but if they occurred, they likely occurred in the pre-Ilkhanid period. This work proposed earlier that the double shelled brick dome was employed more frequently in the Seljuq period, unlike Wilber. If so, the system of construction of double shelled brick dome was transmitted from Seljuq to Ilkhanid builders by the examples of monuments and especially by apprenticeship and spread by migrating builders' workshops.

Single Dome (Type 1)

Wilber documents six cases of use of the single dome on Ilkhanid monuments used to either cover a square or octagonal structure.⁴¹⁶ He considers the dome of the Uljaytu mausoleum at Sultaniyya an example of a single shelled dome, but this is in fact a double shelled dome with the two shells interconnected by a system of arched ribs.⁴¹⁷ Wilber also proposes that the dome of the Varamin Friday mosque is a single shelled dome.⁴¹⁸ He also points out that the dome covering the main prayer hall of the Ushturjan Friday mosque is single shelled, but that the interior and exterior profiles of the dome differ in their form.

True Double Shelled Dome (Type 2)

Wilber considers the double dome of the Sultan Sanjar mausoleum to be one of the earliest examples of such a dome type and states that it was not being employed in areas to the east of Iran in the pre-Ilkhanid period.⁴¹⁹ He also proposes that the form of the mausoleum's dome is of a purely experimental type, because the exterior dome shell is needlessly made lighter by use of pointed arch arcades in two disproportionate storeys.⁴²⁰ Detailed observations of historic photographs of the Sultan Sanjar mausoleum⁴²¹ suggest that the principles for construction of its double shelled dome are not entirely dissimilar from the internal rib system of the Uljaytu mausoleum at Sultaniyya. If so, the proposed relation in the two systems of dome construction may indicate the transmission of building models and systems between the Seljuq and Ilkhanid periods.

Perhaps the most monumental example of this type of dome is presented by the Uljaytu mausoleum at Sultaniyya (diameter: 24,5 m; Cat. No. 27).⁴²² The mausoleum's monumental core is octagonal and it is topped by the dome consisting of two shells. The transitional zone consists of squinch elements, which are covered by three tiers of muqarnas; externally the transitional zone is concealed by the gallery on the mausoleum's third storey. The image of the interior of the dome structure at Sultaniyya, taken around 1936, by Robert Byron,⁴²³ prior to the major interventions on the monument, provides evidence concerning the modality of the

⁴¹⁵ Wilber 1955, 63.

⁴¹⁶ Summary from: Wilber 1955, 62.

⁴¹⁷ See Brambilla and Moradi, "The Mausoleum of Ali-Shah; Fifty Years of Misunderstanding," paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

⁴¹⁸ Wilber 1955, 62. But the dome of the monument's prayer hall appears to have been rebuilt in the post-Ilkhanid period.

⁴¹⁹ *Ibid.*, 62.

⁴²⁰ *Ibid.*, 63.

⁴²¹ Knobloch 2001, 138; http://www.archnet.org/sites/3954/media_contents/28812 (Last Accessed: March 26, 2021).

⁴²² Wilber 1955, 62.

⁴²³ Robert Byron (photographer), Conway Library, Courtauld Institute of Art, Image ID: IMG08684.

construction of the dome.⁴²⁴ The photograph documents traces of the monument's original scaffolding, which consist of holes in the interior of the dome's surface, filled with remains of the wooden timbers of the scaffolding, which were sawn off upon the completion of the monument's construction. The scaffolding was inserted into the core of the interior double dome's shell as it was being constructed; it provided for the structural support of the dome while it was being built, for the working platform for the builders and for the means of transporting the material to the top areas of the monument (upon or during its construction, the craftsmen employed it to decorate the interior surface of the dome). Wilber proposes that this scaffolding could also carry centring or form boards for the dome, although he finds this unlikely.⁴²⁵ These traces of scaffolding indicate that the dome was built without centring or a wooden structure and that scaffolding was employed for its support until the dome's completion. Wilber mentions that he did not document evidence of holes for scaffolding around the dome apex,⁴²⁶ but this is contradicted by the listed evidence documented by Byron at Sultaniyya. It was therefore not necessary to erect a free-standing scaffold on top of the large one to decorate the apex of the dome, as suggested by Wilber.⁴²⁷ Exterior surfaces of mausoleum's supporting walls also retain remains of scaffolding which was employed to build the monument's structure and to decorate its exterior surfaces. It is likely that the external scaffolding was employed for the exterior dome shell and for application of glazed revetments (from top to bottom) upon the construction of its structure.

Wilber notes that the general tendency for Ilkhanid double shelled domes was to build a hemispherical-form interior dome and a more steep, with a sharper profile, exterior shell.⁴²⁸ Wilber proposes that the popularity of the double shelled dome during the Ilkhanid, Timurid and Safavid periods, is due to the union between symbolic, aesthetic and practical aspects.⁴²⁹ It is likely that the symbolism of the dome was taken from Christian architecture in the early Islamic period. In this manner, in Islamic architecture, the domed structure came to symbolize the civil and the spiritual authorities. Wilber also proposes important considerations regarding the aesthetics of the double dome. Any dome structure accentuated the height of the building and formed a conspicuous outline.⁴³⁰ The two shells of the double dome enabled the interior (mainly hemispheric) dome to relate proportionally and visually to the interior of a monument. The outer shell could be built to feature a different form, higher than the interior hemispherical dome, with a higher drum and even a rib system (characteristic of Timurid period), in order for the dome to be visible and to express the monumental appearance of the monuments without disrupting the harmonious appearance of its interior. Another advantage of using a double shelled dome was the fact that the exterior dome protected the interior dome from deterioration. Wilber mentions that several double shelled dome structures were built to feature an intramural staircase, which served for maintenance and repair. A good example is the double shelled dome of the Kishmar tower (c. 1300) in north-eastern Iran.⁴³¹ The described logic of aesthetics of form and proportion, which was characteristic of the Ilkhanid monuments, is in fact different from the majority of monumental structures built in the Seljuq period and it thus presents an Ilkhanid development. This development of the Ilkhanid pointed ovoid dome led to the

⁴²⁴ See also Wilber 1955, 66.

⁴²⁵ Wilber 1955, 66.

⁴²⁶ *Ibid.*

⁴²⁷ *Ibid.*

⁴²⁸ *Ibid.*, 62.

⁴²⁹ *Ibid.*, 64.

⁴³⁰ *Ibid.*, 64.

⁴³¹ *Ibid.*, 120-121; <https://archnet.org/sites/17083> (Last Accessed: April 16, 2021).

development of the bulbous dome in Timurid and later periods.⁴³² The available evidence suggests that the practice of reveting the exteriors of the domes with glazed revetments pre-dates the Ilkhanid period considerably.⁴³³

Double Shelled Domes with Exterior Conical (Tent) or Polyhedral Roof (Type 3)

This type of dome was frequently employed for monuments of limited or medium dimensions and especially for mausolea. This dome form was widespread in north-western Iran and the northern part of central Iran. Some examples are found in north-eastern Iran, above all in funerary structures. The specific solution of covering an interior hemispherical dome with a considerably higher conical or polyhedral dome must have been the builders' solution of forming a visual device, which highlighted the central part of a monument and rendered it of more monumental appearance. The described architectural form was documented in an extensive number of mausolea in the area of Qum (Cat. No. 15).

j.) Muqarnas Domes

Wilber does not mention muqarnas domes in his classification of dome types. Yet these architectural forms require attention, because they present a specific modality of constructing dome structures and because some Ilkhanid monuments retain them. Two main types of such domes can be distinguished: single muqarnas domes and double-shelled domes with interior muqarnas dome shell. Such structures, especially single shelled muqarnas domes present a long-standing tradition in Khuzistan plain and in Iraq. For the Ilkhanid period, double shelled dome use with interior muqarnas shell was recorded on several significant monuments. Perhaps the best-known example is the interior muqarnas shell and exterior polyhedral shell of the shrine of 'Abd al-Samad in Natanz which seems to be work of Ilkhanid builders (Cat. No. 12). The location of the monument in the northern part of central Iran might reflect the fact that it was built by a workshop which had to be summoned for the given commission, because this type of dome is rarely documented in the given geographical area. Another significant monument with an interior muqarnas dome shell is the Imamzada Muhammad on the island of Kharg, to which the builders likely travelled from the area of Khuzistan to construct it. One of the most important Ilkhanid monuments in the Iraqi territory was located in Mosul, the 'Awn al-Din mausoleum which featured an interior muqarnas dome shell.⁴³⁴ Further information on muqarnas domes has been published by Harb,⁴³⁵ and currently a PhD research work on the subject is being conducted by Farzaneh Khamseh at the University of Bamberg.⁴³⁶

k.) Minarets

Perhaps the most monumental minarets of the Iranian territory are those which were built in the Seljuq period. These minarets were constructed out of brick with a double skin connected by the staircase structure and could reach monumental heights. The Ilkhanid builders inherited the minaret construction know-how from their predecessors and some similar minarets remain from Ilkhanid times. Some especially well-preserved examples of Seljuq and Ilkhanid minarets are located in the surroundings of Isfahan. Perhaps the best examples of Ilkhanid period minarets

⁴³² Wilber 1955, 65.

⁴³³ Wilber 1955, 65.

⁴³⁴ Nováček and Melčák, "Shrines of Badr al-Din Lu'lu' in Mosul: An ex-post reconsideration," paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

⁴³⁵ Harb 1978.

⁴³⁶ Ferzaneh Khamseh, *Memorial Buildings with Muqarnas Domes in south-western Iran (11th – 19th Century)*, PhD research in preparation, University of Bamberg.

are the minaret of the ‘Abd al-Samad complex in Natanz (Cat. No. 12), the portal with flanking minarets of the Madrasa Ghiyasiyya in Qum (Cat. No. 15), the portal of the Nizamiyya mosque in Abarquh (c. 1325),⁴³⁷ the Do Minar Dardasht in Isfahan (c. 1330-40),⁴³⁸ the Minar of the Bagh-i Qush Khana (c. 1330-50)⁴³⁹ and the Do Minar Dar al-Battikh (c. 1325-50).⁴⁴⁰

1.) Mihrabs

Mihrab is one of the most significant elements of Islamic architecture and it was an essential part of the majority of religious Ilkhanid monuments. Its primary function is to mark the *qibla* wall and to indicate the direction of prayers, towards Mecca. Moreover, the mihrab is the focal point of prayer rites. In congregational mosques, it is frequently flanked by a minbar which is employed for the Friday sermon. The basic visual form of the mihrab was established in the early Islamic period, but the designs of Ilkhanid carved stucco mihrabs, and proportions of some of them were refined; their basic arched structure is closely related to Ilkhanid mihrabs in lustre tile medium.

The mihrab design is formed by a pointed arch surmounted by a pair of columns, which form a recessed niche; this structure is framed by one or more bands of epigraphic or abstracted vegetal or geometric elements from its three sides. The exterior form of the mihrab is thus a vertically positioned rectangle. Research of the Uljaytu mihrab (Cat. No. 1) indicates that likely, Golden mean proportions were employed to determine its dimensions. This might have been a common practice for mihrabs of the Ilkhanid period, although some of them are relatively squat for different reasons. The Tabriz Friday mosque mihrab (Cat. No. 24) appears squat, due to the changes to the prayer hall’s floor level, which cover the lower parts of the mihrab. The carved stucco mihrab of the mosque at the Pir Husayn Khanqah at Qubalibalaoğlan (Cat. No. 25) is of squat form, which was determined by the available space for the mihrab, which was installed as a redecoration intervention over a considerably smaller carved stone mihrab. In some cases, dimensions and proportions of Ilkhanid mihrabs, such as at the Sujas Friday mosque (Cat. No. 35), were partially determined by pre-existing mihrabs.

Wilber notes that it was not possible to determine differences in proportions of Seljuq and Ilkhanid mihrabs.⁴⁴¹ The use of secondary mihrabs was not frequent in the Ilkhanid period, but a closer look at the monuments and their stucco repertoires reveals that in fact several Ilkhanid mihrabs were not positioned in locations of primary significance (the *qibla* wall of the main prayer hall), but into prayer halls of secondary significance, and mosques frequently had more than one mihrab.⁴⁴² In many cases, monuments featured several mihrabs produced in various historic periods and located in different architectural spaces of the monuments, where Ilkhanid mihrabs were additions to existing repertoires.⁴⁴³

In the Ilkhanid period, the following media have been documented as employed for mihrab production: carved stucco, applied moulded and stencilled stucco combined with carved stucco, wall painting, glazed and terracotta element compositions, lustre tile and perhaps infrequently

⁴³⁷ See Wilber 1955, 167.

⁴³⁸ See *Ibid.*, 167-169.

⁴³⁹ See *Ibid.*, 169-171.

⁴⁴⁰ See *Ibid.*, 171.

⁴⁴¹ *Ibid.*, 74-76.

⁴⁴² Compare to the the Uljaytu mihrab (Cat. No. 1), mihrabs of the Pa Minar mosque at Zavara (Cat. No. 6) and mihrabs of the Sava Friday mosque (Cat. No. 34).

⁴⁴³ The best example are the numerous mihrabs of the Sava Friday mosque (Cat. No. 34).

carved wood. This is slightly different, compared to the Seljuq period, in which carved stucco, terracotta and carved stucco and carved stone were the most commonly employed media for mihrab production.⁴⁴⁴ These differences are in line with the developments of architectural revetment artistic techniques and media which also differ in frequency of use between the two periods. From among the extant Ilkhanid monuments and their architectural revetments, carved stucco was the most widespread medium for mihrab production. This was likely determined by the popularity of the medium, availability of expert craftsmen and raw material, and costs of production of stuccos. Moreover, differences in occurrence of carved stucco and other mihrabs can be discerned based on geographical units; stucco mihrabs were produced where the material was available (gypsum) and craftsmen operated in these areas. Elsewhere, other media predominated, as determined by material and expertise availability. Only lustre tile and glazed and terracotta element composed mihrabs are distributed unevenly, due to the possibility of their partial or complete pre-fabrication and transport over more extensive distances.

2.5 Ilkhanid Architectural Style

The purpose of this section is to answer the research question asking: *What is distinctive of Ilkhanid architectural style?* Its discussion is based on the assessment of what was characteristic of Ilkhanid monuments, compared to pre-Ilkhanid and post-Ilkhanid architectural styles and what were thus the distinctive features of Ilkhanid architecture.

Wilber attempts to propose remarks concerning Ilkhanid architectural style, its characteristics and differences, within a greater chronological and geographical contexts. He summarizes his observations by stating that, compared to the pre-Ilkhanid, especially Seljuq architecture, Ilkhanid architecture was characterized by the refinement of architectural elements and forms, which he further subdivides into different aspects of architecture and its changes. The section attempts to provide some information, but further systematic research of monuments with 3D documentation and precise measurements would be necessary to propose more substantial and updated finds concerning the matter.

According to Wilber, architecture of Ilkhanid period reveals a series of diverse aspects of refinements of architectural elements and compositions which were already in widespread use in Seljuq times.⁴⁴⁵ There was an increased attention to the verticality and accentuation of vertical axes of monuments. Moreover, architectural structures of monuments were made to appear lighter where possible, which also increased the homogeneity between the monuments' interiors and exteriors. According to Wilber the described appearance of the monuments was achieved through a set of combinations of architectural devices, which are different from those of the Seljuq period.⁴⁴⁶ Wilber concludes by stating that the attention of the Ilkhanid builders was pointed to the lightness of monuments where this was possible. Use of windows increased, which also transformed the interior appearance of monuments, which received considerably more light, compared to pre-Ilkhanid monuments.

Compared to Seljuq monuments in Ilkhanid structures, the distance from the floor to the top of the dome was higher in comparison to the width of the monument's domed chamber.⁴⁴⁷ This greater height was further accentuated by diminishing the area which was occupied by the

⁴⁴⁴ Lustre tile medium appears to have been employed for Seljuq mihrabs only seldom.

⁴⁴⁵ Summary from: Wilber 1955, 76-78.

⁴⁴⁶ Summary from: *Ibid.*, 76-78.

⁴⁴⁷ Wilber 1955, 76.

interior transitional zones.⁴⁴⁸ Although the first examples of entrance portals formed by pointed arches and occasionally topped by a pair of minarets derive from the Seljuq period, this architectural form developed further during Ilkhanid times.⁴⁴⁹ These developments comprised accentuation of vertical axes of entrance portals, of their dimensions and of dimensions of the minarets topping them.⁴⁵⁰ Some of the best examples of Ilkhanid portals are the Uljaytu portal of the Bayazid Bistami complex in Bistam (Cat. No. 19), the portal of the no longer extant *khanqah* of the ‘Abd al-Samad complex in Natanz (Cat. No. 12) and the northern portal of the Ushturjan Friday mosque (Cat. No. 4). This development is connected to the use of the true double-shelled dome in Ilkhanid architecture which enabled the builders to accentuate the exterior vertical axis of monuments by building a large exterior dome.⁴⁵¹ It did not disrupt the proportions of the monuments’ interior architectural spaces, which were related to the hemispherical or low-pitched shells of the interior dome shells.⁴⁵² Tomb towers become proportionally higher in comparison to the dimensions of their ground plans.⁴⁵³ Refinement of architectural compositions is discernible in some mihrabs and some entrance portals of Ilkhanid monuments.⁴⁵⁴ Their proportions were made more slender (the mihrabs and portals are narrower and higher, compared to Seljuq examples).⁴⁵⁵ Architectural details such as recessed niches or colonnettes of small dimensions were employed in order to render the supporting architectural surfaces more composed and visually dynamic.⁴⁵⁶ Compared to the Seljuq period, the recessed niches and colonnettes seem to have been transformed to greater height in the Ilkhanid times.⁴⁵⁷

Conclusion

This chapter provides information related to diverse aspects of Ilkhanid architecture, building technology, materials and architectural elements. It provides the context for the discussion of Ilkhanid stuccos in the following chapters and information for a better comprehension of the Catalogue of Monuments appended to this research. It was necessary to provide this discussion to inform about the modern understanding of Ilkhanid architecture and to add some new observations and to refer readers to further literature on the subject. It was also important to revise Wilber’s information concerning Ilkhanid architectural structure, because it remains one of the most significant works on the subject. In addition to this, some further conclusions can be drawn from the discussion which regards Ilkhanid monuments and their architectural revetments.

In conclusion, most monument types, building technology and architectural elements were transmitted from the Seljuq to the Ilkhanid period by means of apprenticeship and continuity of building activities, which were not substantially interrupted or affected by the Mongol invasions of the Iranian territory. Furthermore, a slight standardization and a lesser variety of architectural solutions can be observed in Ilkhanid monuments, compared to their Seljuq predecessors. Although there were no substantial innovations of architectural solutions and elements in the Ilkhanid period, a certain refinement of monument proportions and forms of architectural

⁴⁴⁸ Wilber 1955, 67.

⁴⁴⁹ *Ibid.*

⁴⁵⁰ *Ibid.*

⁴⁵¹ *Ibid.*, 77.

⁴⁵² *Ibid.*

⁴⁵³ *Ibid.*

⁴⁵⁴ *Ibid.*

⁴⁵⁵ *Ibid.*

⁴⁵⁶ *Ibid.*

⁴⁵⁷ *Ibid.*

elements did take place. Further changes comprise frequency of occurrence of types of monuments with a greater significance of pilgrimage complexes, mausolea and Sufi institutions in place of tomb towers. It has been demonstrated that in the Ilkhanid period, earlier monuments were frequently enlarged, rebuilt, repaired and redecorated as necessary for the urban infrastructure. In fact, the high frequency of these activities, in comparison to construction of new monuments, which present for roughly half of interventions during the Ilkhanid period, needs to be acknowledged as a significant characteristic of Ilkhanid architecture.

Although Ilkhanid builders and architects did not contribute inventions of new architectural elements or monument types to the history of architecture, some advancements can be listed. They comprise refinement of visual forms and development of production technology for muqarnas and especially new media and artistic techniques for production of architectural revetments, such as new artistic techniques for carved stuccos, applied moulded and stencilled stuccos and glazed media. Inventions of these new technologies likely determined the change in the syntax between architectural structures and their programmes of architectural revetments. The main aspect of the change of the syntax between architectural structures and revetments is that the decorative revetment programmes became more independent from architectural structures. Accordingly, visual forms and designs of architectural revetments did not necessarily reflect architectural lines or forms of architectural elements. This determined new aesthetic appearance of monuments' interiors and exteriors. Moreover, new decorative media and artistic techniques impacted dimensions of decorative repertoires which became more extensive, compared to the majority of pre-Ilkhanid repertoires. Use of diverse materials and media for architectural revetments likely widened the chromatic spectrum of Ilkhanid revetments and thus greatly impacted visual appearance of Ilkhanid monuments. In sum, these developments ultimately determined considerably distinct aesthetics of Ilkhanid monuments, compared to pre-Ilkhanid and post-Ilkhanid architecture.

Chapter Three: Ilkhanid Architectural Revetments – Stuccos – Artistic Techniques and Formal Characteristics

Introduction

The aim of this chapter is to propose a taxonomy of carved stucco artistic techniques to improve the comprehension of Ilkhanid stucco production technology. This taxonomy of artistic techniques stems from field observations of stuccos and it enables a discussion of Ilkhanid stuccos in this research work. It functions as the base for the discussion of stucco revetments, their craftsmanship, visual characteristics, function, meaning and aesthetics. Lack of literature on the subject of technology and artistic techniques of Ilkhanid and Islamic revetments, above all carved stuccos, results in consequent absence of adequate terminology for their discussion. New terminology is accordingly introduced to ease the examination of the subject and to provide relevant points of reference. Differently from Islamic architectural revetments, the medieval architectural revetment techniques in Europe received far greater scholarly attention, which constitutes a separate field of studies. This research accordingly adopts the framework and some expressions for the discussion of Ilkhanid revetments from literature on European medieval architectural revetment techniques.

The chapter continues with the examination of visual characteristics of carved stuccos focusing on their inscriptions. It provides a taxonomy of inscription styles and collected data regarding content of inscriptions on Ilkhanid stuccos. Inscriptions are given attention in this chapter, because of the intrinsic relationship between stucco artistic techniques and their calligraphic and ornamental elements. The production of certain calligraphic styles and ornaments required the use of diverse artistic techniques which often required the stucco design to be transferred into or performed on the stucco surface in a distinct manner. Stucco artistic techniques therefore determined the stucco relief, its iconographic and epigraphic content and finally, when combined with colour, its overall aesthetic appearance. The proposed information serves as the basis for the comprehension of painted stucco, geographical spread of artistic techniques, decorative and re-decorative undertakings, the craftsmen's artistic notion for production of stuccos and ultimately their aesthetics, which are given attention in the following two chapters. The last part of the chapter is dedicated to the visual features of stucco designs, vegetal and geometric elements and their compositions. The discussion is arranged into groups of related stuccoworks, for which the research proposes their characteristic visual elements and aesthetic features.

3.1 Taxonomy of Stucco Artistic Techniques

Background

The scarcity of literature concerning Islamic stucco artistic techniques, Ilkhanid stucco revetments included, leaves an extensive gap in knowledge and understanding of how Ilkhanid stuccos were produced and how their production process impacted the overall visual appearance of stuccos. Wulff's publication on arts and crafts from 1967 remains one of the few points of references in Western literature.⁴⁵⁸ The monograph by Aslani from 2014 focuses on the history of Islamic stucco artistic techniques in the Isfahan region, but it is lacking a systematic approach and a chronological framework.⁴⁵⁹ More substantial research has been published concerning

⁴⁵⁸ See Wulff 1966, 133-135.

⁴⁵⁹ Aslani 2014. Compare to Kamalizade and Kamalizade 2016.

Islamic stucco techniques and production technology in Spain by Ramón Rubio Domene.⁴⁶⁰ But this information needs to be comprehended in an indicative manner, because stucco production technology varies between geographical and chronological contexts. In a similar manner, research of stucco technology of the Sassanid period by Moslem Mishmastnehi, provides for comparative material.⁴⁶¹ Rather than indicative of stucco production technology of the Ilkhanid period, these publications need to be treated as comparative material.

Lack of discussion of stucco production technology and stucco artistic techniques resulted in superficial comprehension of stuccos in Western art historical literature. Islamic art historians commonly approached discussion of Ilkhanid (and other) stucco revetments based on the criterion of stylistic comparison. By doing so, they discussed stuccos based on their visual elements, studies of inscriptions and especially by focusing on their ornamental iconography.⁴⁶² The multitude of diverse approaches to stucco production, design transfer and stucco carving were almost entirely ignored and are accordingly given attention in this chapter. The fact that the knowledge of stucco body production and carving determined the final appearance of stuccos was not discussed. In order to fill these gaps, this chapter provides a preliminary taxonomy of stucco artistic techniques, which is based on field observations and documentation of Ilkhanid and pre-Ilkhanid stuccos. As mentioned, substantial archaeometric research would have to be performed on stuccos from at least the early Islamic period until the Late Ilkhanid times, to comprehend the basics of their production technology and the differences in their production technology which occurred through time.

Instead of attempting to differentiate between diverse types of stucco artistic techniques and their epigraphic and ornamental content, scholars classified and discussed stuccos according to their *style*. None of the scholars directly explains what the term *style* comprises (e. g. Ilkhanid stucco style, Seljuq stucco style), but it is possible to discern its meaning from scholarly publications.⁴⁶³ For Ilkhanid stuccos, their style is often characterized based on the characteristics of stucco relief (shallow, protruding, interplay of shadow and light) combined with most common types of calligraphic inscriptions and floral ornaments. In sum, the Ilkhanid stucco style is distinct from Seljuq and pre-Seljuq stucco styles, in the following manner: the stucco relief is more protruding and therefore the contrast between its light and dark parts is more evident. Furthermore, Ilkhanid stucco revetment repertoires are often understood as lacking uniformity, unlike Seljuq stuccos, which presumably display a more uniformly carved, shallow reliefs of stucco revetments.

a.) Stucco Body, Stucco Support and Stucco Layers

Fig. 15.

The main material for the production of Ilkhanid stuccos was gypsum.⁴⁶⁴ Gypsum is a naturally occurring sulfate mineral.⁴⁶⁵ In its natural state, its chemical formula corresponds to $\text{CaSO}_4 \times 2 \text{H}_2\text{O}$ (calcium sulfate dehydrate).⁴⁶⁶ Depending on the temperature and length of burning

⁴⁶⁰ Rubio Domene 2010.

⁴⁶¹ Mishmastnehi 2016.

⁴⁶² See, for example: Pope and Ackermann 1977 [1938-1939], Vol. 3, 1291-1321.

⁴⁶³ See, for example: Shani 1989; Shani 1997.

⁴⁶⁴ For bibliography on the subject, see Rubio Domene 2010, 21-23. For a discussion of gypsum mortars, see Middendorf 2002.

⁴⁶⁵ Rubio Domene 2010, 24-29.

⁴⁶⁶ *Ibid.*, 24-25.

gypsum can transform into diverse raw materials.⁴⁶⁷ For the production of stuccos either calcium sulfate or hemi-hydrated gypsum ($\text{CaSO}_4 \times \frac{1}{2} \text{H}_2\text{O}$) were employed.⁴⁶⁸ Hydration of the gypsum (addition of water to gypsum, for stuccos around 18,6 % of water) provides the raw material.⁴⁶⁹ Further additives in diverse proportions can be added to this basic stucco body depending on the function of stucco (coarse layers, fine layers; see below).⁴⁷⁰ The obtained stucco body can be further worked mechanically (e. g. the *killed plaster*, see below). Stucco revetments are subsequently formed by application of different layers of stucco body, with differing compositions, onto the stucco support.⁴⁷¹ Through its setting (drying), a change of the stucco body crystal structure occurs. Furthermore, its mechanical properties change to form a harder material. The crystal structure of stuccos and additives to gypsum determine the porous structure of stucco revetments, which requires treatment before their colouring.

Stucco revetments are applied onto architectural surfaces, which they cover, embellish and revet.⁴⁷² The zero layer of the revetment is the architectural surface, which acts as the support for stuccos. The support has to be sufficiently firm and solid to be able to carry the weight of these revetments. Its surface has to be prepared for the subsequent layers of revetment to fully adhere. The support for the revetment is subsequently covered with several coarse layers of stucco, which correspond to *arriccio*⁴⁷³ layer of the wall painting medium. The function of these coarse layers is to provide the basic stucco body structure on which finer layers of stucco are applied. Coarse layers mediate between the stucco revetment support and the carved stucco layers. Moreover, they provide the basic form (mihrab structure, lunette base, panel structure) for finer stucco layers, which are carved. Coarse stucco layers comprise stucco body mixed with further coarse particles, such as sand, which ensure the gypsum, sand and water mixture adhesion and higher structural resistance, to carry the fine stucco layers. Since coarse layers are not carved, they do not need to consist of finer particles. A larger number of coarse layers of stucco is needed, in comparison to the fine stucco layers, in order to provide the basic form of stuccos.⁴⁷⁴

⁴⁶⁷ Rubio Domene 2010, 24.

⁴⁶⁸ *Ibid.*, 24. See also Kingery *et al* 1988, 221-222.

⁴⁶⁹ Rubio Domene 2010, 25-26.

⁴⁷⁰ Compare to Rubio Domene 2010, 136.

⁴⁷¹ Compare to *Ibid.*, 208-210, 217-218.

⁴⁷² The term “revet” implies that the architectural surfaces were coated with architectural revetments. It is the preferred term in this research work due to the neutrality of its meaning; it does not imply that revetments retained a strictly or decorative function.

⁴⁷³ A coarse layer of gypsum-based material.

⁴⁷⁴ With higher proportion of sand or other inorganic particles, the production cost of coarse stucco layers is reduced.

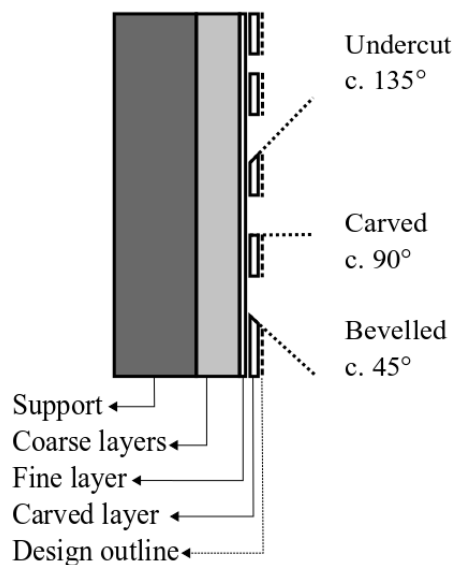


Figure 15: Basic scheme of layers of material for production of carved stucco revetments and types of stucco carving depending on the angle between the carving tool and stucco layers.

Application of coarse stucco layers is followed by application of finer stucco layers and their carving. These layers are thinner in comparison to coarse layers. Perhaps the first layer is applied to unify the stucco revetment surface. This is followed by application of stucco layers which were carved. Differently from coarse layers, which are applied on large surfaces, layers of stucco for carving are applied in amounts, which correspond in portion of carving work, which can be performed until the stucco body dries off. These stucco layers contain a larger amount of gypsum,⁴⁷⁵ probably around at least 70 % and up to 90 %, and often talcum powder,⁴⁷⁶ and other additives such as plant ash⁴⁷⁷ or feldspar.⁴⁷⁸ For carved stucco layers, working of stucco body, before its application on the revetment surface, and use of additives, are determining factors for its mechanical characteristics. Depending on mechanical characteristics, stucco can be applied in differing thicknesses and carved in diverse manners. Especially the angle at which stucco is carved strongly depends on the mechanic characteristics of the stucco body. The stucco revetment can be made by carving a single stucco layer, or carving several stucco layers, which are consecutively applied and carved. If stucco revetment is produced with carving of several stucco layers, the stucco ornamentation design has to be drawn on the surface of each layer separately. After the stucco carving is completed, stucco has to be treated and its porous surface must be rendered less permeable in order for paint to be applied.⁴⁷⁹

⁴⁷⁵ Material employed for these stucco layers had to be sieved several times in order to eliminate large stucco particles, which would obstruct stucco carving and reduce the fineness of carved stucco relief.

⁴⁷⁶ Finely ground marble.

⁴⁷⁷ Plant ash additives increased the water resistance of stuccos.

⁴⁷⁸ This information is retrieved from archaeometric analyses of stuccos at the Koç mosque in Hasankeyf. See Demirci *et al* 2002, 81-88.

⁴⁷⁹ Wulff 1966, 135.

Ilkhanid Stucco Support Types

Fired Brick Support

The most frequently occurring type of support are walls of fired brick onto which the revetments are applied. These walls can either date to the Ilkhanid period or they could have been constructed at an earlier point. Fired brick support is one of the most common supports for stucco revetments for several reasons. The majority of preserved structures dating to the Ilkhanid or earlier periods were constructed out of fired brick and stucco revetments were applied onto these surfaces. Moreover, fired bricks constitute a solid architectural structure, which can easily carry the weight of stuccos. Fired brick material is relatively water resistant which protects stuccos from the humidity infiltration and assures their preservation.

The relationship between stucco revetments and their support changes drastically between cases where the revetments are contemporary to the wall construction and where the revetments are applied to earlier supporting walls, which were completed prior to the application of the stucco revetments. The Marand Friday mosque mihrab (Cat. No. 22) is installed into an earlier architectural structure, as a part of its refurbishments (as stated in its epigraphic repertoire). The mihrab leans against an older supporting wall, into which it is not integrated; this might have caused the distortion in its lower section.⁴⁸⁰ The same phenomenon can be observed in the Friday mosque of Isfahan, where the Uljaytu mihrab was installed against an older Seljuq wall (Cat. No. 1).⁴⁸¹ In contrast, at the Kucha-yi Mir mosque in Natanz (Cat. No. 31), the supporting wall was built in form of a niche in order to accommodate the stucco mihrab, which indicates that the supporting wall and the mihrab are contemporaneous.

Adobe Brick and Rammed Earth Wall Support

Adobe brick and rammed earth wall supports are less common types of support for Ilkhanid stuccos.⁴⁸² It could either be the original wall of the structure, contemporary to the stucco revetments, or the same type of support can be a result of a monument modification intervention, where stuccos were applied on a closed off opening to either change the function of an architectural space or to conceal the act of the closing off of a passage (see Chapter 5; Section 5.2). The main drawback of such supports is it is less resistant to erosion in comparison to the fired brick wall. Moreover, such a support retains water and humidity, which can cause damage to the stuccos. Stuccos on such support could be more prone to distortion which can occur during the setting of the stucco body. One of the best preserved examples of a stucco revetment repertoire applied on adobe brick support are the stuccos of the Haftshuya Friday mosque (Cat. No. 3). Its mihrab was applied onto an adobe wall which served to close off an opening in the walls of the mosque's domed prayer hall.⁴⁸³

⁴⁸⁰ This likely resulted in the distortion of lower portions of the mihrab.

⁴⁸¹ The Uljaytu mihrab leans against the supporting wall, rather than organically emerge from the wall. Only its smaller central niche interacts with the supporting wall structure. This niche was either there before as part of an earlier mihrab, or it was produced by the craftsmen to increase the adherence of the mihrab against the supporting wall.

⁴⁸² This could be due to the lesser resistance of adobe-built monuments (to the atmospheric agents), compared to those constructed of fired bricks. Fewer adobe-built monuments are preserved, compared to fired bricks.

⁴⁸³ At Haftshuya, the stuccos do not reveal damage caused by wall distortion, because at the point when the adobe walls could not carry the dome, the dome collapsed and its weight therefore did not affect the stuccos.

Kahgil Support

In some cases the support of stucco revetments was a layer of *kahgil*⁴⁸⁴ which is most frequently applied on adobe brick walls. This phenomenon is observed at the Haftshuya Friday mosque (Cat. No. 3), where stucco revetments in blind niches are applied onto layers of *kahgil* supported by adobe brick wall. Similar to the adobe bricks, *kahgil*, is not water resistant and it retains humidity. It however acts as a mediating layer between adobe brick walls and stucco revetments, and it reduces the torsion caused by the seasonal increase or reduction of volume of adobe bricks. *Kahgil* was specifically employed as support for Ilkhanid wall paintings.

b.) Ilkhanid Stucco Relief Layers Structure

Coarse Stucco Layers

Little is known about Ilkhanid stucco revetment coarse layers, due to the lack of archaeometric analyses of their material composition. Damaged stucco repertoires allow for the coarse layers to be observed *in situ*. The two best examples are the Friday mosques of Marand (Cat. No. 22) and Haftshuya (Cat. No. 3). At Marand, lower damaged parts of the mihrab indicate that coarse layers of stucco have been applied onto the support in layers of different thicknesses. Visual observations show relatively large sand particles in these layers. The particles reduced the costs of coarse stucco layers and increased their structural stability. Until detailed archaeometric analyses are performed on such stucco layers we have to speculate on their composition. Logically, the largest part of the stucco body would consist of gypsum and different locally available sands. It would be reasonable for the first ground layers of stucco to consist of prevailing sand materials and a smaller part of gypsum which functioned as a binder. Ground stucco layers, similar to wall paintings, likely consisted of gypsum and sand in a ratio ranging between 1:3 and 1:2. Subsequent layers were made less coarse and contained a larger amount of gypsum with a ratio of 1:1.⁴⁸⁵ Coarse stucco layers inevitably contained organic and inorganic additives.⁴⁸⁶ Differently to fine layers of stucco, coarse stucco layer additives were the result of the stucco material making process rather than deliberate additives, which would change the stucco layer constitution and characteristics. Among the most likely organic additives charcoal or wood fibres could be the result of the gypsum firing process.⁴⁸⁷ Sand particles were likely recovered from sweet water streams or quarried in mountains. Compounds such as iron oxides, sulphur oxides, alkaline elements can be hypothesized as originating from the gypsum (impurities).⁴⁸⁸

Fine Stucco Layers

Fine stucco layers of Ilkhanid stuccos lack archaeometric research, which could provide detailed information about their material composition. Material used for these layers of stucco had to be prepared with greater care in comparison to the supporting coarse layers. The material and stucco body had to be finer in their constitution, to enable precise working and carving of the stucco body. These layers consisted prevailing of gypsum to which a small portion of fine sand and talcum powder could be added. Talcum powder required considerable labour for its production and it was perhaps used for commissions with more extensive budgets. The stucco

⁴⁸⁴ A mixture of mud, water, and straw.

⁴⁸⁵ See the analytical data gathered by Demirci *et al* 2002, 81-88.

⁴⁸⁶ *Ibid.*

⁴⁸⁷ Moslem Mishmastnehi, personal communication to the author.

⁴⁸⁸ *Ibid.*

body was produced by a mixture of gypsum mixed with water and its mechanical properties depended on additives or the way it was mechanically worked. The crystal composition of stuccos changed through the process of setting, which determined their hardness. Stucco craftsmen knew which additive should be employed for a stucco layer and a carving which was required for different types of ornamentation or epigraphy.⁴⁸⁹ Some indicative information regarding stucco additives and working can be proposed based on extant archaeometric information and by observing the current stucco craftsmanship practices.⁴⁹⁰

The colour of fine stucco layers often reveals natural additives, which were already contained in the gypsum or the sand. Stuccos in the Isfahan region are characterized by a brown to brown-red colour, which stems from the local gypsum supplies and it might indicate the presence of ferrous oxides. The stuccos of the Bayazid Bistami complex in Bistam (Cat. No. 19) are of a dark grey colour, indicating a local type of gypsum, which might be caused by the presence of volcanic material or a high content of charcoal. Stuccos of north-western Iran, such as the Marand mihrab (Cat. No. 22), consist of yellow to ochre colour stucco body, possibly caused by the presence of sulphates or ferrous oxides. Khurasan stuccos such as at Farumad (Cat. No. 16) are characterized by beige pink to ochre colour, which might also be caused by the presence of ferrous oxides. These colour observations provide indicative and preliminary information regarding differences in the composition of fine stucco layers.⁴⁹¹

In sum, these indicative differences of the presence of different minerals suggest that gypsum and sand material used for stucco body production were locally quarried.⁴⁹² It is plausible that the material used for stucco partially determined its mechanical characteristics and therefore it impacted the possibilities of stucco working – the carving process. These stucco material characteristics could be manipulated through the inclusion of diverse additives and through distinct approaches to the mechanical working of stucco. It was therefore the craftsmen who knew how to work the stucco and who determined its mechanical characteristics for the making of stucco reliefs. The presence of different stucco artistic techniques, as enabled by the stucco body characteristics, therefore largely depended on the knowledge of the stucco craftsmen who produced and worked the stucco.⁴⁹³

Killed Plaster - Gach-i Kushta

*Killed plaster*⁴⁹⁴ is a regular gypsum body which is worked mechanically by stucco craftsmen. Mechanical working consisting of continuous stirring and beating of the stucco during the setting process, causing the crystalline molecules formed between gypsum and water to break. This causes the stucco to acquire a clay-like consistence and its setting time is extended. Accordingly, stucco can be worked across a longer time span, approximately forty-eight hours.⁴⁹⁵ Through this process, the stucco body acquires distinct mechanical properties: it can

⁴⁸⁹ The difficulty of extracting organic additives from the stucco body renders it a challenging task for archaeometrists to determine which additives were used in Ilkhanid stuccos.

⁴⁹⁰ The text is based on practical lectures by Moslem Mishmastnehi, on the occasion of the conference, *I Love Persian Stucco*, University of Bamberg, April 10-12, 2017.

⁴⁹¹ It is possible to hypothesize that coarse stucco layers also reflected similar colours and stucco composition.

⁴⁹² This is also the most feasible solution, given that a large amount of material was needed for stucco revetments production. It would not be feasible to transport this material over long distances if it was locally available.

⁴⁹³ It should therefore also be possible to propose information regarding stucco craftsmen workshops' mobility based on minute observations of how the stucco body was worked and the stucco relief produced.

⁴⁹⁴ The killed plaster is one of the practices first noted by Wulff, who however does not specify the exact function of this type of stucco body.

⁴⁹⁵ Wulff 1966, 134-135.

be carved in different ways, but the nature of the carving is different: the edges of the produced stucco relief are less sharp and they are often oblique or bevelled. This material is employed for fine layers of stuccos carved out of one layer, or out of two or more layers.⁴⁹⁶ This manner of mechanically working the stucco material might be an Ilkhanid period invention.⁴⁹⁷

Stucco Bodies with Ash or Plant Additives

Plant ashes or plant additives ease stucco body carving and render more precise stucco perforation forms. Carving of such stucco produces very sharp edges and the angle between stucco surface and the tools presumably ranges between sixty and ninety degrees. The final result of carving is a stucco relief with very sharp edges and perforations and contrasting shadow and light effect. The presence of ashes in stucco might have rendered them more resistant to water. Addition of other plant material to the stucco body caused chemical reactions, which resulted in the breaking of molecular bonds between the gypsum and water molecules. These additives slowed down the drying process of stucco (hydration). They thus prolonged the stucco drying process in a similar way to killed plaster, but without impacting the mechanical characteristics of the stucco body. Stucco body with plant additives could therefore be carved to feature sharp edges and a deep contrast between pierced, carved and uncarved parts of its relief.

c.) Use of Nails and Pegs for Ilkhanid Stuccos

Use of nails has been attested during the restoration and research of the Uljaytu mihrab (Cat. No. 1).⁴⁹⁸ Stucco craftsmen used iron nails of ten to twelve centimetres in length in order to connect consecutively applied layers of stucco and render the mihrab structure more solid. Further research revealed cases of the use of smaller wooden pegs, which aided the adhesion of fine layers of stucco relief, at the Pir-i Bakran mausoleum (stuccos dated 1312-13; Cat. No. 2) and the mihrab and some stucco panels of the last decorative phase at the Farumad Friday mosque (Cat. No. 16).⁴⁹⁹ This use of nails and wooden pegs must have been a common practice of the Ilkhanid stucco craftsmen.

d.) Giornata in Stucco Working

Fig. 16.

The phenomenon called *giornata* in Italian and *tagwerk* in German can be described as *segmented work* in English.⁵⁰⁰ This term is commonly used to denominate the amount of work performed by artists when producing wall paintings *a fresco* (on wet support).⁵⁰¹ *Giornatas* on wet support wall painting are easy to discern, caused by different proportions of pigments and water resulting in different shades. This segmented work phenomenon is employed here to

⁴⁹⁶ Aslani 2014, 82.

⁴⁹⁷ Moslem Mishmastnehi, personal communication to the author.

⁴⁹⁸ Isfahani *et al* 2010, 435.

⁴⁹⁹ In all cases nails resulted concealed to the eye in the final product and they were only revealed on the damaged parts of stuccos.

⁵⁰⁰ The term could be translated as: the *work of one day*. The term *segmented work* has been employed for the first time in this research to described the practice, due to the lack of a corresponding terms in English. See Weyer *et al* 2016[2015], 74-75.

⁵⁰¹ The term is most commonly used for discussing Medieval artistic techniques and it was coined by Italian scholars. One of the best examples of *giornatas* visible to the eye are the frescos executed by Giotto and his assistants at the complex of Saint Francis at Assisi. Another famous example of *giornatas* are the frescos of the Sistine Chappell, by Michelangelo and his assistants.

describe the carved stucco revetment production process. But in the case of the Ilkhanid stucco revetments, the work of stucco craftsmen did not necessarily finish at the end of the day. It was explained above that the preparation of stucco layers with different mechanical working procedures or additives extended the time during which stucco could be worked and carved to around forty-eight hours, or possibly longer, if the stucco was worked during the cold months of the year and artificially kept constantly damp. Therefore, a stucco *giornata* would indicate a segment of craftsmen's work, which could last several days.

Observations of damaged stuccos which reveal their stucco layers, suggest that there is a substantial difference in segmented work between coarse and fine layers of stuccos. Coarse layers did not require precise working. For coarse layers, the entire surface of the revetment (e. g. panel, lunette, mihrab) had to be worked at the same time and stucco layers were applied on large surfaces, and when they became solid enough, subsequent layers were applied. Applied fine layers, which were subsequently carved, required a substantial amount of precise manual labour consisting of the transfer of the stucco design onto the stucco surface and the carving of these designs. These activities drastically reduced the time during which it was possible to work the stucco body. The surface of the stucco revetments therefore had to be worked in segments. Stucco segments are discernible in abrupt breaks and differences in stucco reliefs. They were concealed by craftsmen painting the stucco or they were organized in the way that segments occurred on joints between panels. In other words, more extensive stucco revetments, such as mihrabs, could be divided into smaller panels, and one work segment would constitute one panel, which would enable the craftsmen to conceal the discontinuity between stucco revetments as caused by segmented work.

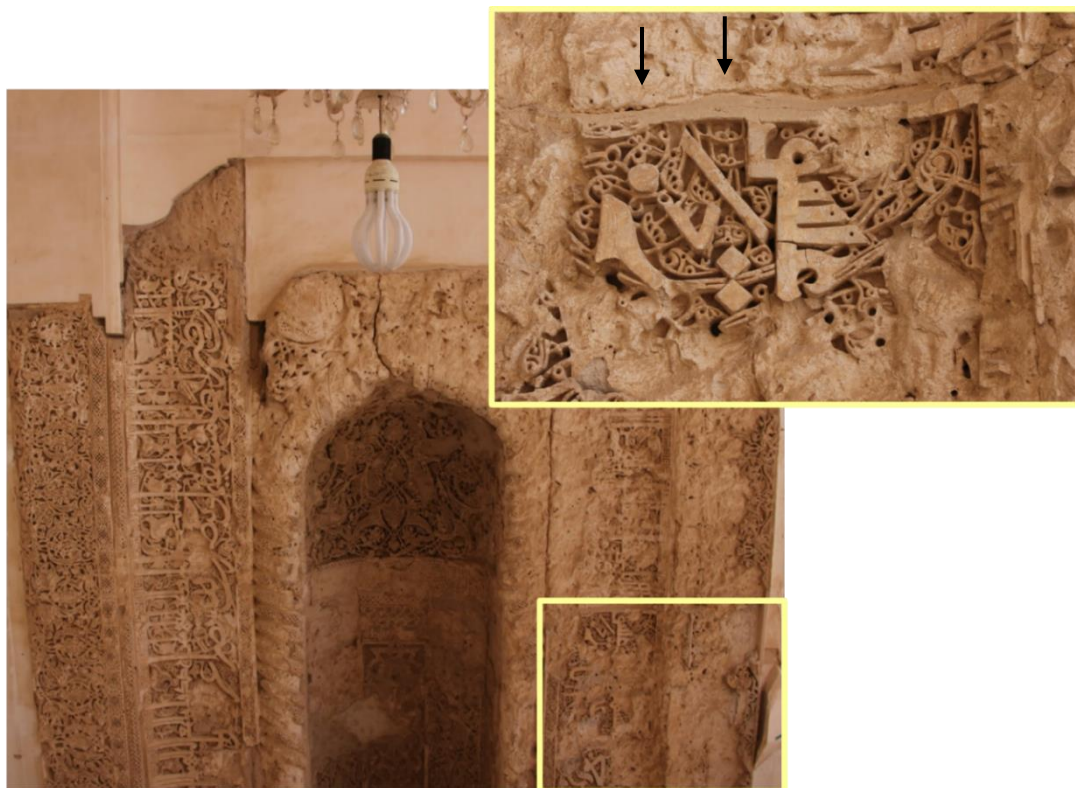


Figure 16: An example of evidence of a segment of work in Ilkhanid carved stucco at the Abarquh Friday mosque mihrab (1338).

Damaged stuccos, or stuccos which lost their original paint, allow the segmented work to be discerned. The best Ilkhanid stucco example is the Abarquh Friday mosque mihrab (dated 1338;

Cat. No. 10).⁵⁰² The mihrab lost its upper part, its paint and on several spots also its upper layers of carved stucco relief. Through the aging process the stuccos kept drying and losing water which resulted in the shrinking of the stucco and the appearance of cracks between the mihrab's panels revealing the segmented work.⁵⁰³ It becomes evident that this stucco revetment, carved out of at least two consecutively applied layers of stucco, was worked slowly, because segments comprise relatively small portions of the inscription band.⁵⁰⁴ Segmented work for inscriptions, which read in the direction right to left, partially determined the directions of craftsmen's work (e. g. for mihrabs, in the counter clockwise direction). Furthermore, evidence of joints between stucco panels, from mihrabs at Nushabad, Kashan and Qamsar, suggests that the external parts of mihrabs were completed prior to their central panels. The evidence provided by the Uljaytu mihrab (Cat. No. 1) with its Hadith inscription continuing on the lower located inscription arch, indicates that craftsmen first produced external framing bands and they only subsequently proceeded to work on the mihrab's central parts.⁵⁰⁵

e.) Design for Stucco Making

Figs. 17-20.

Documentation of stuccos in this research provides evidence indicating that the stucco designs which were sketched out before they were transferred on the stucco medium, were preliminary plans. Through the stucco design outlined on the stucco surface and by the means of the stucco carving process, these designs were gradually refined, modified, adjusted and corrected up to the point when they acquired their final form after their carving (see Chapter 5; Section: 5.3). The final stucco revetment appearance therefore differed from the originally prepared design, sometimes only in minute details and in other cases was drastically modified.

Blair proposes that stucco revetment design was created with the use of paper on a 1:1 scale⁵⁰⁶ by the means of stencils or transfer by dust sprinkling. While such practices were frequently employed for Ilkhanid wall paintings, the design transfer for carved stucco involved separate procedures. The three-dimensional form of carved stucco reliefs meant the stucco designs had to be incised or outlined into several consecutively applied and carved layers of stucco, as divided into separate visual planes. The design division into visual planes was performed for each plane to correspond to a separately applied and carved stucco layer. Furthermore, as shown above, carved stuccos required for their reliefs to be carved in segments; this further reduced the feasibility of the use of stencils or the dust sprinkling method for their design transfer. Rather, stucco design was mostly transferred from a small dimension sketch or preliminary design onto the large stucco surface in different ways; by free-hand outlines, incisions of baselines, gridlines, and similar. In fact, each type of visual elements of carved stuccos (vegetal,

⁵⁰² Amir Hossein Karimy, personal communication to the author.

⁵⁰³ Arid climate also seems to have impacted the aging process of the mihrab's stucco.

⁵⁰⁴ The segments amount to around quarter of a square meter area. One segment of work consisted of the application of the first stucco layer. Upon that, the design of this stucco layer was applied on its surface with red colour, of which traces remain. After the stucco layer was carved, the missing parts, which were intended to protrude, were covered with stucco, their design was applied on them and they were carved. These diverse stucco layers finally constituted the entire stucco relief.

⁵⁰⁵ Future archaeometric research should show the variation ratio in stucco composition between the *giornatas* and perhaps also provide answers regarding the duration of *giornatas* and sequence of on-site procedure in stucco relief production.

⁵⁰⁶ Blair 2003, 39-46; Blair 2006, 254-5.

geometric, calligraphic) required a different design transfer method which depended on its formal characteristics and scale.

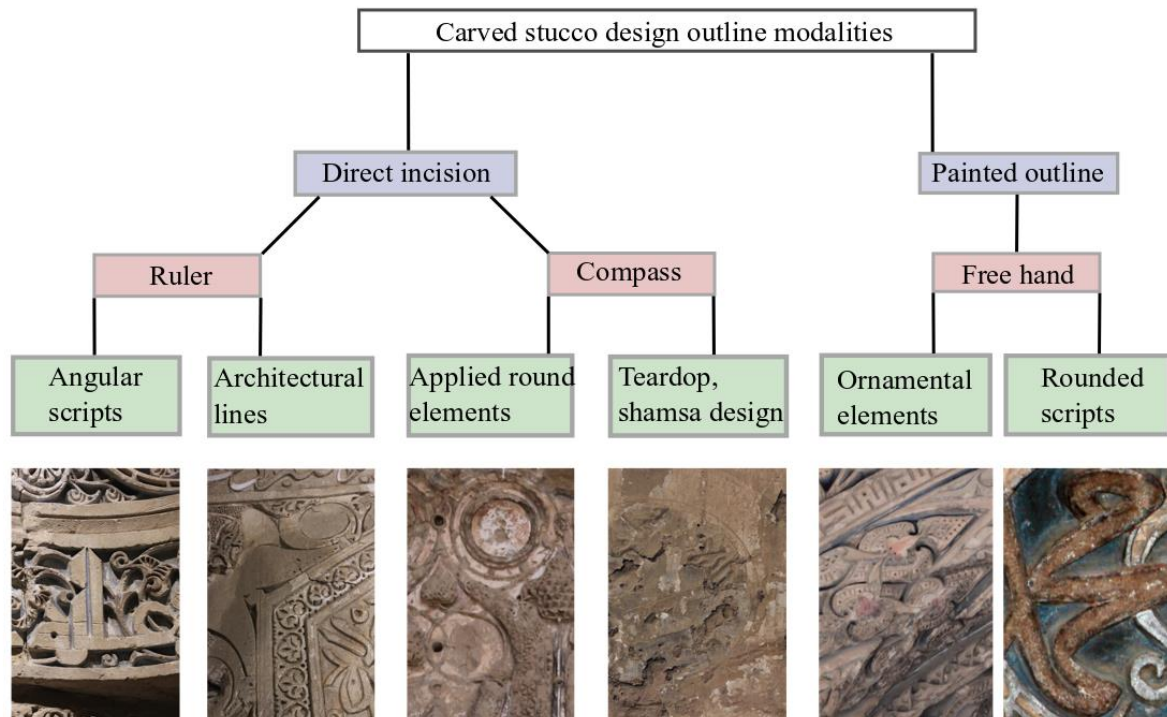


Figure 17: A hypothetical taxonomy of different types of carved stucco design outline modalities.

One of the arguments proposed by Blair in favour of the 1:1 transfer of stucco design from paper, was the availability of large sheets of paper, which emerged in the Ilkhanid period.⁵⁰⁷ Observations of stucco revetments from wider chronological and geographical contexts reveal that practices of Ilkhanid stucco design production and artistic techniques stem from a long-standing tradition of stucco art. They were therefore inherited by the Ilkhanid stucco craftsmen from their predecessors as a know-how which evolved across a more extensive geographical unit spanning from Mesopotamia to Central Asia. These design practices can be traced back to at least the early Islamic period and in some cases also to stucco revetments produced during the reigns of pre-Islamic dynasties, such as the Sassanids.⁵⁰⁸ Moreover, the closest medium related to stucco, and architectural revetment design making and transfer, is the terracotta medium.⁵⁰⁹ Slightly differently, as it is shown in a separate discussion, the Ilkhanid wall paintings and applied moulded and stencilled stucco media⁵¹⁰ reveal substantial evidence for the practice of design transfer with either the use of stencils and probably the dust sprinkling method, and also the creation of certain types of designs with direct incisions, and by means of the use of ruler and compass. This largely unaddressed theme of Ilkhanid architectural

⁵⁰⁷ Blair 2006, 255.

⁵⁰⁸ Field research by the author documented traces of stucco design incisions on stuccos of Tappa Mil near Rayy and on stuccos of Dargaz Bandian. See also Azarpay 1997.

⁵⁰⁹ This is illustrated by important examples and remaining evidence of design transfer and execution of terracotta medium found in the Nishapur area.

⁵¹⁰ For the detailed discussion of applied moulded and stencilled stucco artistic techniques, see Aslani 2014, 289-301; Alvandiyani 2010; Alvandiyani 2012.

revetment artistic techniques requires a taxonomic discussion, provided here, which enables the examination of other aspects of these revetments and their better understanding.

Two main approaches to the production or application of stucco design onto its surface have been discerned: direct incisions and painted outlines. Direct incisions were produced either free-hand or by use of rulers and compasses. These incisions were outlined on the stucco surfaces with sharp objects such as stucco cutting knives or perforating pointed metal tools. The painted outlines are of different types and range from precise stucco ornamentation designs, outlines of areas where subsequent layers of stucco had to be applied, to free-hand-outlined inscriptions. The most common, or at least the most preserved type of outlines consists of red outlines.⁵¹¹ Extensive amounts of remaining stucco design traces and observations of stucco revetments *in situ* allow information regarding types of stucco design transfer and approach to stucco carving based on primary evidence to be proposed.



Marand Friday mosque mihrab dated 1330-31; detail shows ruling traces for the mihrab design.



Figure 18: Example of architectural lines, direct incisions with ruler, on the unrestored parts of the carved stucco mihrab of the Marand Friday mosque (Cat. No. 22).

Ruling Incisions

Observations of Ilkhanid stucco revetment repertoires reveal three main types of direct design incisions on stucco surfaces which were produced with the aid of rulers. These incisions were produced with sharp, pointed metal tools and either a normal small ruler made out of metal or

⁵¹¹ In some cases preliminary archaeometric analyses confirm the assumption that hematite pigment was used for stucco design outlines. This reflects pragmatic aspects of stucco craftsmanship: hematite was one of the cheapest pigments, which was widespread and therefore easily available.

wood, or a fine cord could be used instead (especially for large scale incisions). No traces remain, but cords could be dipped into dry pigment, such as charcoal, and they would leave a painted trace behind them. Cord, a flexible material, unlike a metal or wooden ruler, was a particularly useful tool which enabled the incision of straight lines onto convex surfaces.

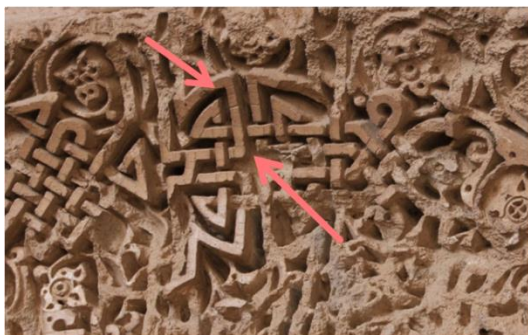
Incisions produced with rulers served diverse functions. Straight-line incisions could be used to create a grid which was employed as a point of reference for the transfer of grid-based inscription styles such as *Khatt-i banna'i* or Square Kufic. Ruler incisions could also be employed for the production of panel designs, in other words, division of stucco revetments, such as mihrabs, into separate panels. These divisions and therefore the basic design of the mihrab or of more complex stucco revetments could be achieved with the aid of rulers. The third type served to make or copy the inscription designs which was frequently employed for diverse styles of Kufic (angular scripts). Regardless of ornamentation, shaft elongations, and proportions, most Kufic inscriptions reveal ruling baseline incisions which were used as a point of reference for the incision of Kufic inscription designs.



Farumad Friday mosque stucco in North iwan, dated c. 1320. Use of compass for floral design.



Turbat-i Jam stuccos with direct incisions, dated 1327-8.



Use of compass for geometric ornamentation topping the inscription in the North iwan (left) and on the mihrab (right).



Figure 19: Some examples of design incisions on carved Ilkhanid stuccos.

Free-hand Incisions

Some stucco revetments also reveal evidence of free-hand incisions of stucco design.⁵¹² These incisions were used for two types of stucco elements. On the one hand they were employed for repetitive, mostly arabesque patterns, which were easy to design. On the other hand, some cases

⁵¹² These incisions are evidently left, where the carving required for the design to be adjusted and they remain visible for this reason and because the stuccos lost their paint.

reveal examples of more elaborate inscriptions (round scripts), which were incised free-hand by skilled craftsmen. Alternatively, a local calligraphy expert could have been called to incise such inscriptions, which would subsequently be carved by stucco craftsmen.

Compass Incisions

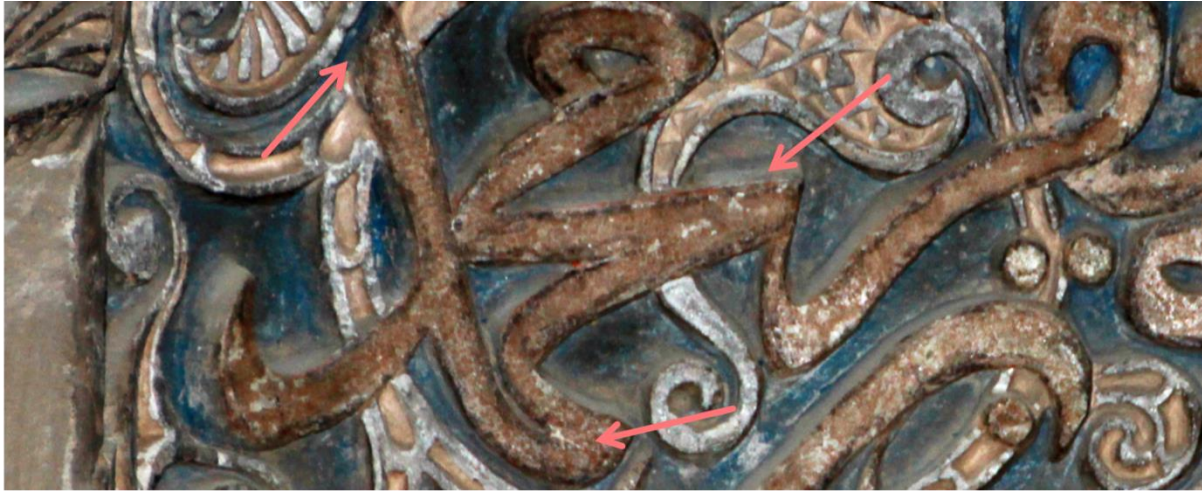
Incisions made by a compass (or a cord compass) were used for the creation of circular stucco designs. The compass could be made out of metal or wood, or for large scale stucco revetments, it could be substituted with cord.⁵¹³ These circular compass incisions served to provide a basic reference for circular stucco designs (*shamsas*, tear drop medallions, etc.). On a more reduced scale, compass incisions served to denote areas where protruding circular bosses were subsequently applied onto stucco reliefs. Moreover, circular incisions could be employed in cases where inscription elongations evolved into circular geometric designs. The majority of geometric designs required the use of a compass for the creation of base reference lines or division and subdivision of stucco surfaces, on which the final geometric design would be completed with straight ruling incisions.

Free-hand Painted Outlines for Floral Designs

These outlines are created by breaking up the final stucco ornamentation design into separate planes which were produced separately on superimposed layers of stucco carved in sequence of their application. On the first layer of stucco, these outlines are normally less detailed and they often comprise entirely coloured fields in form of basic design carving. Sometimes these outlined areas are combined with incisions of basic stucco ornamentation forms. As the application proceeds and upper layers of stucco have to be carved, design outlines become more refined. On the second layer of stucco, they delineate precise designs for stucco carving and uncarved areas are simply coloured red. These red outlines are produced free-hand and occasionally they delineate outer boundaries of stucco inscriptions, which are carved. These outlines are often combined with free-hand incisions of designs of floral forms. Evidence for this practice is normally found on stucco revetments, where upper layers of carved stucco were lost, due to their lesser adhesion to lower layers of partially carved stuccos (e. g. the monumental mihrab lunette of the Sujas Friday mosque mihrab; Cat. No. 32).

Stucco design divided into numerous planes and carved into separate layers of stucco is therefore sandwiched between layers of stucco and in final product it is concealed from the viewer. The final layer of carved stucco design remains on the stucco surface, but it is covered by the polychromy layer. Stucco perforations normally, due to their repetitive nature and ease of production, would not need to be outlined with colour, although some incised baseline traces are occasionally documented and seem to have served as guidelines for stucco carvers. Frequent occurrence of red outlines for stucco design, especially rather repetitive floral ornamentation, confirms the assumption that floral stucco ornamentation was not produced with the aid of stencils.

⁵¹³ In contemporary practices, a cord compass consists of a pointed element to place in the middle of a circular design and an incision tool at the other end of the cord which is used to directly incise circular designs.



The Uljaytu mihrab. Red inscription outline is covered by the black final outline for the carving procedure.



The Pir-i Bakran mausoleum. Funerary chamber, stucco panel dated 1303-4, red outline for the inscription.

Figure 20: Some examples of painted design outlines on Ilkhanid carved stuccos.

Free-hand Painted Outlines for Inscriptions

The most challenging and intriguing category of stucco design outlines found on Ilkhanid stuccos are outlines for monumental inscriptions (round script styles), especially for those inscriptions which reflect the advanced calligraphic skills of their makers. The two most important cases comprise the stucco mihrab and the burial chamber panel of the Pir-i Bakran mausoleum (Cat. No. 2), dated 1303-04 and the *Thuluth* inscription of the Uljaytu mihrab (Cat. No. 1). These inscriptions required a separate method for the preparation of their designs for stucco carving. Because of their oblique forms ruling or use of compass was not required and these inscriptions had to be produced free-hand by a person skilled in calligraphy.

It was argued that the Uljaytu mihrab's quality of stuccos is exceptional, due to the paper availability, which enabled the transfer of stucco and calligraphic design onto stucco surface (with aid of stencils or via the dust sprinkling method). Stencils enable the exact transfer of a design but substantial evidence regarding stucco production techniques provide arguments to reject the hypothesis that stencils were used in these cases. Firstly, if stencils were used, there would be no need to correct the design which was outlined with red colour on the Uljaytu mihrab, by subsequent tracing of the design with black colour. Secondly, work on several layers in order to produce the stucco revetments of both mihrabs would require the stucco design to be divided into several visual planes and transferred onto different layers of stucco for its carving. Such use of stencils would not be feasible and it was not necessary, given the possibility of directly incising or outlining the inscriptions onto the stucco layer, and rather simple procedures involving production of background floral scrolls and protruding floral elements. Another important point against the use of stencils is the dated Pir-i Bakran panel,

which reveals the break of the Qur'anic verse in its background Kufic inscription. If stencils were employed, this would not have occurred, because they would have been able to exactly plan the inscriptions.

Hence, the conclusion is that a person skilled in calligraphy, and used to working on large scale surfaces, drew design outlines free-hand onto the stucco surfaces of both stucco repertoires. Due to the necessity of segmented work, this person had to be present at the stucco revetment production site from its beginning until its conclusion. Moreover, the expert had to understand the stucco revetment making procedure. It is therefore most likely that one of the members of the stucco workshop was trained for this purpose, or if a calligraphy expert was called to aid the stucco craftsmen's workshop, they had to be present at the site during the entire project.⁵¹⁴

f.) Types of Stucco Artistic Techniques – Ilkhanid Stucco Carving and Design Practices

Stucco Plugs

Fig. 21.

Ilkhanid stucco plug⁵¹⁵ revetments developed from earlier Seljuq prototypes.⁵¹⁶ In the Seljuq period stucco plugs comprised revetments, which consisted of two elements: fired brick supporting wall and carved stucco plug units which were inserted into the raising joints between fired bricks. This required specific building techniques at the time of monument erection and planning of the plug placements beforehand. The form of stucco plugs varies from square to rectangular. In the process of bricklaying, vertical joints between bricks were filled with mortar and these joints were subsequently covered with gypsum, which was carved or moulded to display geometric, vegetal or epigraphic elements forming the stucco plugs. Most frequently occurring Seljuq plugs comprised diverse geometric designs and occasionally epigraphic elements such as the names of revered figures of the Muslim religion.

The art of stucco plugs evolved in the Ilkhanid period according to the architectural context and necessities.⁵¹⁷ The context of stucco plug production changed because plugs were incised into layers of stucco, which were applied to cover architectural surfaces. Such plugs need not be produced at the time of the monument construction and they could be interventions of later redecorations. This artistic technique became widespread, and it is nowadays understood as the Ilkhanid type of stucco plugs, but earlier Seljuq examples of this practice have been documented.⁵¹⁸ Sometimes such plugs are denoted as pseudo-stucco plugs, or superficial stucco plugs, to illustrate their difference from the earlier stucco plug techniques, which were inserted in wall structures and more frequently occurred in Seljuq times. Evidence from Ilkhanid structures suggests that the Seljuq stucco plug techniques kept being used during the Ilkhanid period, where one finds examples of stucco plugs inserted into raising joints of supporting walls.⁵¹⁹ The stucco plug technique, created by carving of an applied layer of stucco is also suitable for application on architectural structures made out of other construction materials such

⁵¹⁴ Regardless of this, as the section discussing craftsmen's signatures shows, the signing artist of stucco repertoires was the head of the stucco workshop and not the calligrapher.

⁵¹⁵ Stucco plug revetments are revetments which consist of mainly rectangular stucco forms placed between the vertical joints of bricks or covering brick walls. These rectangular inserts comprise epigraphic, vegetal or geometrical elements.

⁵¹⁶ See Aslani 2014, 282-286.

⁵¹⁷ For a detailed discussion of stucco plug techniques and production technology, see Aslani 2014, 93-102.

⁵¹⁸ For example, at the Ribat-i Sharaf caravanserai. See Kiyani 1981.

⁵¹⁹ Compare to the Pir-i Bakran mausoleum (Cat. No. 2).

as adobe bricks, rammed earth or surfaces covered with *kahgil*. These stucco plug revetments could be used to cover large architectural surfaces, and differently from other stucco plug types, they could be employed for inclined or horizontal architectural spaces such as ceilings or squinches.⁵²⁰ This development is well reflected in the ceiling decoration of the Pir-i Bakran mausoleum's *iwan* (Cat. No. 2), where stucco plugs are arranged, based on the grid pattern in the manner for them to form *Khatt-i banna'i* inscriptions which recount the Sunni Shahada. This new approach to stucco plug making rendered production of *Khatt-i banna'i* inscriptions less demanding, and it thus became more widespread in the Ilkhanid period.

The third type of stucco plugs found on Ilkhanid monuments comprises a type of a combination of the two aforementioned plug techniques. In this approach to production of plugs, artists inserted stucco plugs partially into the raising joints of walls and at the same time they covered architectural surface with a thinner layer of stucco. The incising and carving process for production of these revetments consisted of two activities. Stucco plugs, which were half inserted into the supporting wall and half consisting of applied stucco layers, were carved, and the remaining surface of architectural revetments was incised to create geometric patterns either simulating fired bricks beneath the stucco layer or forming new abstract ornamental forms, most commonly in elongated cross form. Such revetments, extensively discussed by Giovanna Ventrone,⁵²¹ are frequently found in the Isfahan region and the best examples derive from the eastern *iwan* of the Isfahan Friday mosque (Cat. No. 1), the domed prayer hall supporting walls of the Ushturjan Friday mosque (Cat. No. 3) and the Pir-i Bakran mausoleum (Cat. No. 2).

The variety and multitude of stucco plug types and their frequent occurrence in numerous monuments across an extensive chronological context determine the difficulty of stucco plug revetment dating, as based on their ornamental elements or production technique.⁵²² For the Ilkhanid period, the variety of stucco plug combinations, their occurrence, and diversity of artistic techniques, render it difficult to propose patterns of production or any precise dating based on their observations. Due to the ease of their production and relatively low cost of the small amount of material necessary for their making, stucco plugs assumed a specific role as stucco revetment type for decoration of architectural interiors and exteriors. Stucco plugs often constituted the background of revetment repertoires, which consisted of revetments produced with different and more demanding techniques and media. The plug ornamentation was normally the first type of revetment which was applied on architectural structures in decoration or redecoration intervention. Production of stucco plug decoration on interiors of domes, inclined arched surfaces, ceilings or higher registers of supporting walls, was particularly frequent and determined by the ease of this artistic technique and its production. Interiors such as the *iwan* of the Pir-i Bakran mausoleum (Cat. No. 2) or the Ushturjan Friday mosque (Cat. No. 3), consist of extensive architectural surfaces covered with stucco plugs arranged in *Khatt-i banna'i* inscriptions (see below).

⁵²⁰ A Seljuq period practice of decorating squinches with such plugs has been documented by Lorenz Korn. Lorenz Korn, personal communication to the author. For the Qurva Friday mosque, see Korn 2018a.

⁵²¹ Ventrone 1981.

⁵²² Moreover, excessive reliance on stucco plugs with similar ornamental elements as dating control evidence can often reveal as misleading. For Seljuq period, relative similarities of stucco plugs, make it difficult to propose a possible chronological frame of their evolution, even if the existence of multitude of plug patterns is rejected, which also remains problematic.

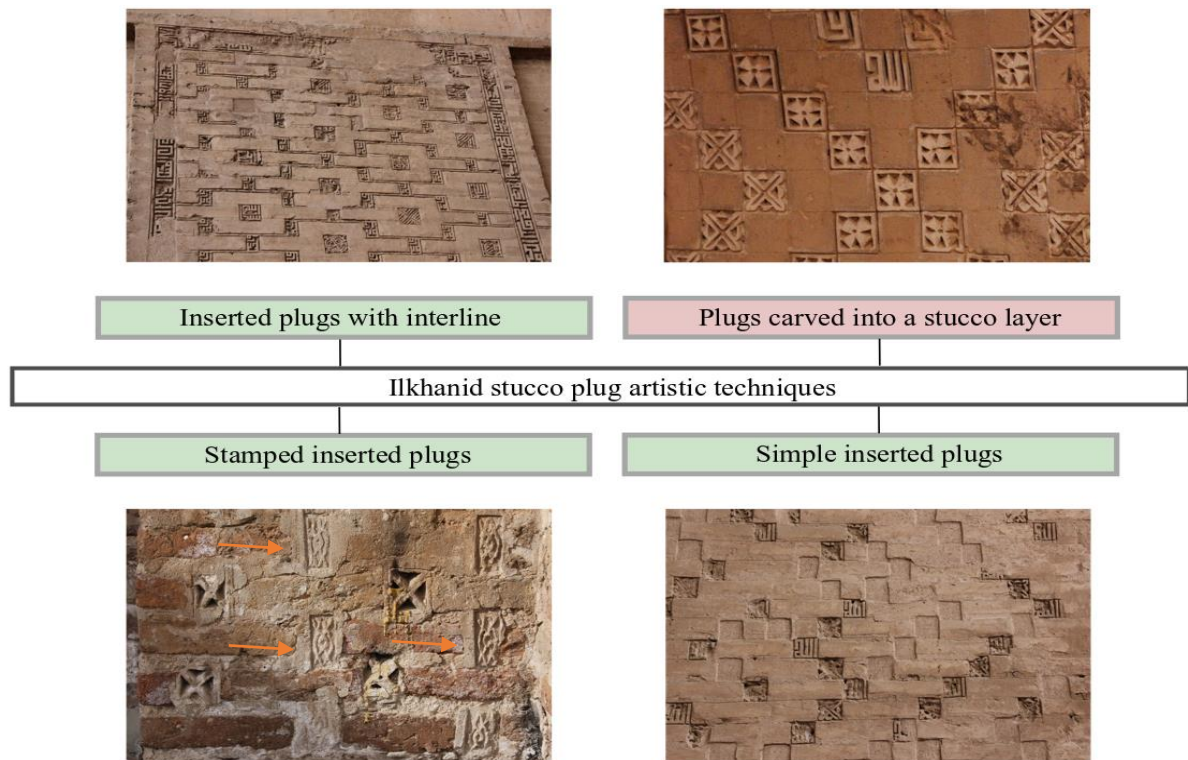


Figure 21: Four main types of artistic techniques for production of stucco plugs, which were in use in Ilkhanid period. Plugs carved into a stucco layer were the most frequently employed artistic technique.

Stucco Perforations

Fig. 22.

Stucco perforations denote a specific approach to stucco carving, which consists of the use of metal⁵²³ tools to perforate stucco surface with repeating patterns. Stucco perforation is performed with pointed metal tools of different forms, which determine the shape of the perforations. Perforation forms vary and most frequently feature triangular, square, parallelepiped, circular and star forms. Stucco surfaces are normally perforated with one type of perforation, but sometimes craftsmen combined two types of perforations in order to variegate perforation motifs. The function of stucco perforation is to reduce the visual weight of stucco revetment planes, which do not contain other ornaments, or to reduce the weight of stucco ornamentation, which consists of large uncarved surfaces. The final appearance of stucco ornamentation thus results in a visual breakdown of larger stucco surfaces into perforated surfaces of interplay between dark perforated parts of stucco and lighter surfaces between stucco perforations. In this respect, stucco perforation can constitute a simple background pattern for the main epigraphic, floral and geometric motifs of stucco panels. On the other hand, stucco perforation can be integrated into the main ornamentation repertoires.

⁵²³ Metal tools enabled to incise stuccos with sharp edges. This would not be possible if tools were made out of wood.

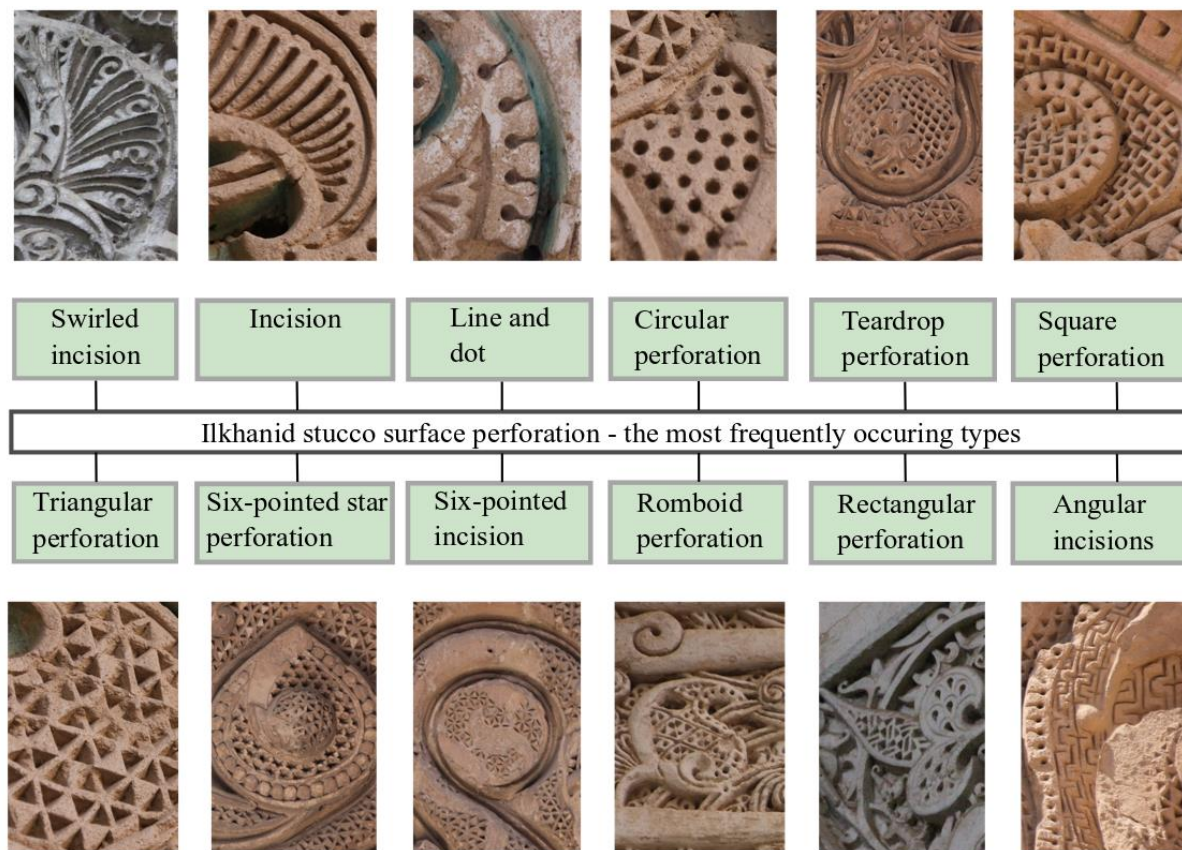


Figure 22: Image showing the selection of the most frequently occurring forms of stucco perforations in Ilkhanid period.

This approach to stucco carving is characteristic of stucco revetments which consist of two or more layers of consecutively carved stucco. Depending on carving type, stucco perforations are most commonly performed on the last stucco layer, which comprises the most protruding parts of stucco revetments.⁵²⁴ Observations of the Ilkhanid stucco perforations suggest that craftsmen were well versed and that they would normally make them free-hand without excessive planning. Some stucco revetments, such as those of the Pir-i Bakran mausoleum (Cat. No. 2), reveal that craftsmen occasionally employed lightly incised baseline systems in order to be able to arrange geometric perforations into more complex patterns.

The difference between Seljuq and Ilkhanid stucco perforations is not their technique, but the syntax and ways of use for production of stucco revetments. During the Ilkhanid period, a relative increase in frequency and occurrence of stucco perforation can be recorded. In fact, the vast majority of Ilkhanid stuccos are extensively perforated. Perforation of protruding stucco ornamentation elements additionally increased the level of contrast between different planes of the stucco revetment relief. Some examples of Ilkhanid stucco perforations are at the Haftshuya Friday mosque mihrab (Cat. No. 3), the second decorative phase stuccos of the Pir-i Bakran mausoleum's *iwan* (possibly created by the same craftsmen workshop as the Haftshuya mihrab; Cat. No. 2) and the Uljaytu mihrab (Cat. No. 1). Observations of stucco perforations of entire stucco repertoires combined with the approach to stucco carving, can provide indication of

⁵²⁴ In some cases where stucco revetments lost their upper carved layers, which used to be perforated, it is evident that the perforations were rather deep, normally a few centimetres, and they sometimes also reached lower layers of stucco.

characteristics of stucco workshops, which, if found similar in other monuments, can suggest that these stuccos are the work of the same stucco workshop.

Stuccos Carved Out of One Layer

Fig. 23.

One of the least demanding stucco artistic techniques comprises stucco reliefs produced by carving one fine layer of stucco body. Accordingly, it is one of the most frequently employed stucco artistic techniques and it has been documented in the majority of the regions of the Ilkhanid Empire.

Upon the application of coarse stucco layers on the support, the craftsmen applied the fine stucco material, of which they carved the final layer. The stucco revetment design was impacted by the necessity of producing it out of one stucco layer. This determined more shallow and non-protruding characteristics of the carved stucco relief. The angle of stucco carving depended on the mechanic characteristics of stucco and the craftsmen's choice. Mostly, the carving angle between the tools and the stucco surface amounted to around ninety degrees. Such a carving angle caused sharp edges on the stucco relief and a strong shadow and light interplay which gave the relief a contrasting and dynamic appearance.

Single layer carved stucco can be found in numerous stucco revetments ranging from the Sassanid, early Islamic to the Seljuq and Ilkhanid periods and it is one of the oldest stucco artistic techniques. In some cases, where the stucco body was not solid enough to be carved at the right angles, stucco reliefs became more shallow and less contrasting. One can compare stuccos of the Kuhpaya Friday mosque (Cat. No. 8), which reveal a lesser stucco production skill, to the mihrab of the Bayazid Bistami complex (Cat. No. 19), where the majority of the mihrab is carved out of one stucco layer, but with considerably more advanced skills.

Stuccos carved out of one layer are frequent in Ilkhanid stucco repertoires. The described characteristics of the stucco relief produced with this stucco technique render it the most suitable approach for stucco carving of long inscriptions, which run along supporting walls, on top of dado areas, below transitional zones or along dome drums. This stucco technique could be employed for stuccos which were located within the reach of the faithful, because they are less fragile in comparison to stuccos produced with more complex artistic techniques. Perhaps the most frequently produced stuccos in this technique are inscriptions with floral scroll backgrounds.⁵²⁵ For the production of this type of stucco revetment the craftsmen applied the stucco design on the stucco surface with direct free-hand incisions. Observations of such incisions on the stuccos of the Farumad Friday mosque (northern *iwan* inscription bands; Cat. No. 16) illustrate that inscription was the first element to be incised and its incision was followed by the incision of background floral scrolls. But both visual elements were carved out of one stucco layer. Sometimes, background scrolls could be reduced in profile, in order to make the inscription stand out.

⁵²⁵ These designs are suitable for such stucco relief, which can highlight the stucco inscription and the background floral scrolls do not obscure its visibility.

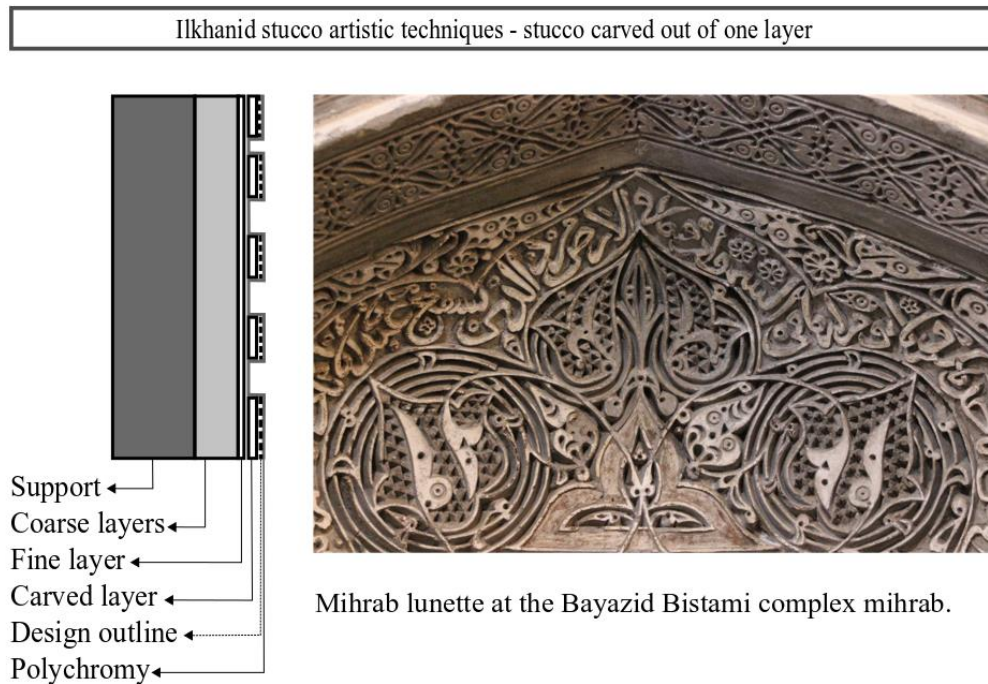


Figure 23: Scheme showing the structure of the stuccos carved out of one layer.

This artistic technique was more frequent in the Seljuq period, but it remained fairly common in Ilkhanid times. Seljuq stucco masterpiece repertoires, such as the stucco revetments of the Ribat-i Sharaf caravanserai (refurbished in 1154-55)⁵²⁶ demonstrate that craftsmen could produce one of the perhaps most significant Islamic stucco revetments with this modest stucco artistic technique. These revetments comprise stucco panels, which were carved out of one stucco layer, but which display two visual planes. During the Ilkhanid period, this trend changed with other stucco artistic techniques, such as stucco carved out of several layers, applied protruding elements and undercut stucco, becoming more frequently employed for stucco production. These artistic techniques required more complex stucco craftsmanship skills, more extensive amounts of labour and material, and they thus resulted in more costly revetments. There was likely a preference to use more complex and more expensive stucco artistic techniques for the production of the most significant stucco repertoires, such as mihrabs or important panels.

Stuccos Carved out of Two or More Layers

Fig. 24.

The stucco technique where two or more layers of stucco were carved developed out of the artistic technique of carving one stucco layer in the early Islamic period. This technique was employed to produce stuccos with a deeper stucco relief of a more contrasting appearance. It requires division of the stucco design into two or more visual planes; these designs were applied onto consecutively applied and carved stucco layers. Nevertheless, stucco reliefs with two visual planes could be also achieved by carving just one fine stucco layer. But such reliefs were shallower compared to stucco reliefs carved out of several layers.

⁵²⁶ TEI 34491 (Consulted on: June 7, 2021).

After the stucco revetment support was prepared, craftsmen applied coarse layers of stucco. Subsequently, they first applied one layer of fine stucco for carving. On its surface, the craftsmen outlined the design. This design precisely outlined the stucco to be carved out of the stucco layer and roughly the parts of stucco to be carved out of the subsequently applied layers of fine stucco. These areas were marked, normally with fields of red colour, which signalled to the craftsmen who carved the first stucco layer that another layer of stucco would be applied in those areas. Remains of this type of stucco design traces are visible on stuccos where the upper layer of revetments was lost. The two best examples derive from the mihrabs of the Friday mosques of Sujas (Cat. No. 35) and Abarquh (Cat. No. 10). Upon the completion of carving of the first stucco layer, craftsmen proceeded with the application of subsequent layers of stucco and their carving. These layers of stucco were only applied on the uncarved parts of the first stucco layer which was selectively carved. Subsequently, craftsmen outlined the design for the stucco revetments on the second stucco layer and carved it.

Some Seljuq examples, such as the mihrab of the madrasa Haydariyya in Qazvin,⁵²⁷ Seljuq inscription bands of the Sujas (Cat. No. 35) and Qurva⁵²⁸ Friday mosques, provide for Seljuq examples of the use of this artistic technique. The difference between Seljuq and Ilkhanid stucco revetments produced by carving of two or more stucco layers is the following. During the Ilkhanid period, layers of carved stucco gradually became thicker,⁵²⁹ which might have been enabled by the additives to the stucco body or a specific manner of its mechanical working, such as the killed plaster approach. The artistic technique is therefore not an Ilkhanid invention, but the produced stuccos were different, due to the thicker layers of stucco and consequently a deeper and more contrasting stucco relief. This stucco artistic technique was often combined with stucco surface perforation in order to render the stucco reliefs more dynamic. The artistic technique was frequently employed for inscription bands with floral scrolls, which contained more protruding floral elements. Therefore, a greater visual emphasis was given to differences between epigraphic and floral elements of stuccos. One such example of Ilkhanid stucco repertoire is the inscription band of the Friday mosque of Varamin (Cat. No. 28), where floral elements of the monumental inscription band in the domed prayer hall protrude from the rest of the stucco inscription band. Another example is the framing monumental inscription band of the Uljaytu mihrab (Cat. No. 1).

⁵²⁷ See Hamidi and Khazayi 2011.

⁵²⁸ Korn 2018a.

⁵²⁹ A separate research would be necessary to determine the exact difference of thickness between Seljuq and Ilkhanid stucco reliefs.

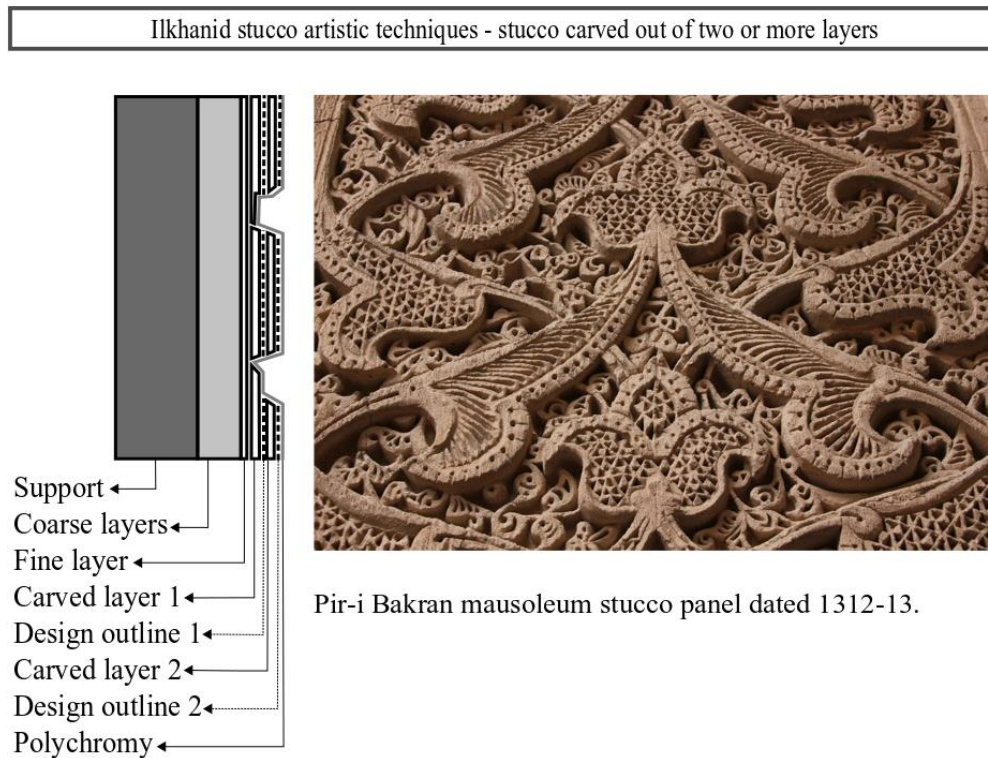


Figure 24: Scheme showing a stucco relief carved out of two or more layers (Ilkhanid period).

Stucco Undercut

Fig. 25.

Stucco undercut⁵³⁰ denotes a stucco carving technique which produces undercut stucco relief: a stucco relief with its parts located below the ornamentation cut away to produce an empty space. In this way, the stucco revetment relief acquires a peculiar appearance, which determines its perception as visually more dynamic, lighter, and variegated. Although this specific approach to stucco relief production is already found in Seljuq stuccos (e. g. the mihrab of the Haydariyya madrasa at Qazvin),⁵³¹ the technique reached its technological climax⁵³² and highest frequency of use during the Ilkhanid period. The artistic technique is especially frequently encountered on stuccos of the Isfahan area (e. g. the Pir-i Bakran mausoleum, Cat. No. 2; the Haftshuya Friday mosque, Cat. No. 3), but examples from other regions (e.g. Tabriz Friday mosque mihrab, Cat. No. 24) testify to its geographical spread.

⁵³⁰ The term *to undercut* can in English signify two different actions: cut away the part below or under (which is the correct significance in the given context) or more simply cut away material to leave (a carved design) in relief, which denotes a simple act of relief creation and is not intended in the given context.

⁵³¹ See Hamidi and Khazayi 2011.

⁵³² The technique likely required a specific type of mechanical working of the stucco body and specific tools for the production of the stucco relief.

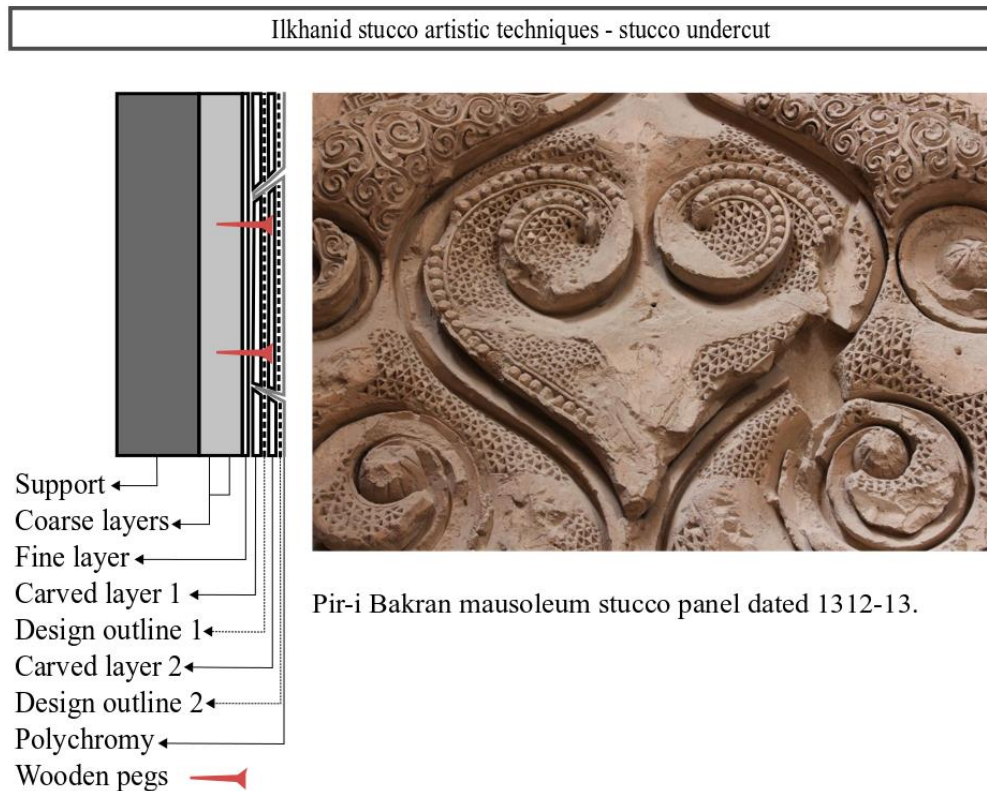


Figure 25: Schematic representation of the stucco relief of undercut stuccos.

For the undercut stucco revetments carving of more than one layer of stucco was required.⁵³³ Two conditions for undercutting of stucco existed. Firstly, special metal tools, with curved incision heads, had to be produced by stucco craftsmen; these tools were employed at a specific carving angle exceeding ninety degrees. Secondly, the stucco body had to be worked mechanically to be strong enough and to not break during the removal of material under the stucco design and for the design not to crumble. This highlights the specific nature of this artistic technique and it suggests that only some workshops or stucco craftsmen possessed the necessary knowledge (of producing the killed plaster?) to make such stuccos.

The stucco undercut technique was almost exclusively employed to produce stuccos with floral or more abstract ornamental designs, rather than inscriptions, and it was often combined with stucco perforation. Some examples of stucco undercutting are found in stucco repertoires of the third decorative repertoire at Pir-i Bakran mausoleum (Cat. No. 2), dated 1312-13 and the Haftshuya Friday mosque mihrab (Cat. No. 3).⁵³⁴ Craftsmen first applied several fine layers of killed plaster stucco body and drew its abstract design free-hand with red paint. They formed the stucco surface by cutting off some edges in a bevelled manner and they perforated the stucco. Subsequently, they applied several layers of stucco on the parts of the stucco layer which were not carved. Wooden pegs were employed to increase the adherence of these protruding parts of stucco relief to coarse stucco layers beneath them. After that the craftsmen first determined the final forms of this top stucco layer with undercutting (performed at an angle

⁵³³ This was conditioned by the fact that for the performing the undercutting, stucco relief had to protrude from its baseline level. Moreover, the more protruding the stucco relief was, the stronger was the undercut appearance of stuccos.

⁵³⁴ As suggested, these stuccos are likely the work of the same stucco workshop.

exceeding ninety and up to hundred and eighty degrees, most frequently around one hundred and thirty-five degrees), and only subsequently they perforated and carved its surface.⁵³⁵ At Pir-i Bakran the combination of bevelled carved lower stucco layer and undercut upper stucco layers resulted in a unique visual appearance of stuccos.⁵³⁶

Pseudo-undercut Stuccos

Fig. 26.

Some stucco artistic techniques mimicked the undercut stuccos without performing the stucco undercutting as described above.⁵³⁷ Stucco craftsmen employed more common stucco techniques of carving several consecutively applied fine layers of stucco for this purpose. The final carved layer of stucco was however cut to appear bevelled, and its edges were cut in diagonal direction for the stucco relief to appear as if it was undercut (Fig. 26). A good example is the Small stucco mihrab of the Isfahan Friday mosque (Cat. No. 1).



Figure 26: An example of pseudo-undercut stucco relief from the Miyandih mosque in Qamsar (interior lunette of the mihrab; Seljuq?).

Shallow Applique Stucco Elements

Fig. 27.

Shallow applique stucco elements artistic technique is not independent and it was always combined with other stucco techniques. The technique served to render stucco reliefs more dynamic by the application of further ornamental elements onto the stucco relief. Craftsmen achieved this by applying floral or lace-like elements, occasionally arranged into nets, on the surfaces of carved and perforated stucco. These elements were applied on upper layers of carved stucco in portions where they were left uncarved on purpose in order to enable adherence of partially pre-fabricated ornaments.⁵³⁸ This technique could be combined with stucco revetments carved in several layers and with stucco perforation and stucco undercut. The best examples are

⁵³⁵ It is possible that the upper stucco layer was first carved and perforated and only then undercut, but the evidence and observations of undercut stucco relief edges suggest that the former practice was employed.

⁵³⁶ Similar practices are found in the Haftshuya stucco mihrab.

⁵³⁷ Pseudo-undercut stucco technique described here designates those stuccos which were produced with other techniques but were made look as if their relief was undercut.

⁵³⁸ Further research would be needed to ascertain to what extent moulds were employed to form such elements.

found at the Pir-i Bakran mausoleum (Cat. No. 2) and the Haftshuya Friday mosque mihrab (Cat. No. 3).⁵³⁹ The Haftshuya stuccos display some of the best examples with this stucco production technique.⁵⁴⁰ The visual effect obtained by the lace-like elements entirely transformed the appearance of the stuccos; they rendered the stucco relief surface substantially more dynamic and reduced its visual weight in a way similar to stucco perforation, but through an entirely distinct visual device and artistic technique. Application of these elements drastically increased the interplay between shadow and light on stucco reliefs. The technique might be an Ilkhanid invention as it is not found in earlier stucco repertoires.



Figure 27: Detail of the shallow applique elements forming the lace-like design on the surface of the carved stucco relief in the Pir-i Bakran mausoleum (third decorative stage; 1312-1313).

Applied Protruding Stucco Elements

Another artistic technique⁵⁴¹ which comprised applying ornamental elements consists of the craftsmen's application, or better, insertion, of one thick and protruding stucco element into almost completed stucco revetment reliefs. Most commonly applied types of protruding elements were geometric bosses. Craftsmen had to plan the presence of bosses in the stucco repertoires before beginning the stucco relief production, because they had to leave a space for their insertion into the stucco surface. Protruding elements could be applied into stucco revetments consisting of one carved stucco layer or multiple superimposed carved stucco layers. In order to apply such elements, craftsmen normally created holes into the stucco relief or scratched its surface to increase their adhesion. They subsequently inserted the partially or almost entirely formed stucco body onto the stucco surface and fixed it into the position with sharp stucco carving tools. They finalized ornamental forms of protruding elements with stucco perforation or carving.

This technique was employed because it enabled the craftsmen to create protruding stucco reliefs. The achieved visual effect is that of a stark contrast between large flat planes of stuccos from which extremely protruding stucco elements emerge. This technique was also known in

⁵³⁹ Damage to the Pir-i Bakran mausoleum stuccos provides evidence of how these elements were applied.

⁵⁴⁰ At Haftshuya, the Shahada panel and the capitals of the mihrab's columns which support its central lunette retain remains of such applied floral lace-like elements, which are applied over undercut and perforated deep reliefs of stuccos.

⁵⁴¹ See Aslani 2014, 105-106.

earlier periods. One of the earliest examples of the technique is found on the stuccos of the Ribat-i Sharaf caravanserai in north-eastern Iran, from the middle of the twelfth century.⁵⁴² During the Ilkhanid period, the use of applied protruding elements became more frequent and they were employed as single or group elements. Isolated protruding bosses were applied on stucco panels such as mihrab spandrels, to increase their monumentality and accentuate the symmetrical designs of the mihrabs. On the other hand, groups of applied protruding abstract elements could be employed to form entire monumental panels for mihrabs or other revetments.



Figure 28: Detail of the monumental lunette of the Tabriz Friday mosque mihrab: it is formed by an accumulation of constructed hollow elements.

Protruding Constructed Hollow Stucco Elements

Fig. 28.

This stucco artistic technique⁵⁴³ comprises production of stucco relief by application or insertion of large protruding hollow stucco ornaments into a carved stucco relief, or as an independent relief production technique. These applied ornamental elements can vary from very simple to more complex. The elements can either be inserted into an almost completed stucco relief, or this technique can be employed to produce stuccos with an ornamental repertoire consisting of protruding elements only. The function of these elements is to render the stucco relief more dynamic by increasing its depth and the shadow and light effect. These elements normally assume forms of abstracted floral ornamentation resembling flower blossoms or leaves or more geometric circular forms. The stucco artistic technique in question is found only occasionally on pre-Ilkhanid decorative programmes, but it is specifically characteristic of Ilkhanid stuccoworks.

Two selected examples of stucco revetment repertoires can be found at the Haftshuya Friday mosque mihrab (Cat. No. 3) and the Tabriz Friday mosque mihrab (Cat. No. 24); they illustrate the described approaches for this stucco artistic technique. The first approach, at Haftshuya, comprises insertion of independent protruding hollow elements into a stucco revetment panel, which was carved out of several layers and heavily perforated.⁵⁴⁴ A more complex type of

⁵⁴² See Kiyani 1981.

⁵⁴³ See Aslani 2014, 133-142.

⁵⁴⁴ The applied elements are located in the central lunette panel of the Haftshuya stucco mihrab (Cat. No. 3).

inserted hollow protruding elements was documented in the central lunette of the Tabriz Friday mosque mihrab. Its revetments in its monumental lunette are produced by extremely protruding hollow blossom-like elements. Unlike the Haftshuya mihrab, at Tabriz, craftsmen produced the entire panel by these applied elements. The final visual effect of the panel resulted in a strikingly dynamic and contrasting abstracted floral revetment lunette. The combination of the framing band of the lunette, concave in form, with the protruding elements additionally increased the mihrab's perceived visual depth.

Perforated Stucco Grills (Openwork)

Fig. 29.

The perforated stucco grill technique⁵⁴⁵ produced specific stuccos: carved stucco panels, with continuous see-through perforations, which transformed the revetments. No earlier parallels for such revetments are found and it is plausible that this stucco production technique was an Ilkhanid invention. The technique, perhaps due to the difficulty of production, or, determined by its specific function, was not widespread. Moreover, most remaining examples seem to have been deliberately damaged. Three Ilkhanid monuments contain(ed) perforated stucco grills. The Uljaytu mihrab in the Isfahan Friday mosque (Cat. No. 1) used to retain two layers of stucco, in its top register, with the upper layer being perforated.⁵⁴⁶ At the Pir-i Bakran mausoleum (Cat. No. 2), two cases of remaining fragments of perforated stucco panels are located in blind niches on supporting walls of the mausoleum's *iwan*.⁵⁴⁷ The fourth example is found at the Urumiya Friday mosque (Cat. No. 23), where the central lunette of the mihrab, which resembles geometric gridlines, is perforated and reveals earlier parts of mihrab underneath.⁵⁴⁸ The three cases of perforated stucco panels cover earlier stucco revetments, which can be seen through the perforations. As mentioned in Chapter 5 (Section 5.3), these grills might have had a specific function of honouring earlier works of stucco craftsmen by symbolical indication of the presence of their works through small perforations.

⁵⁴⁵ See Aslani 2014, 133-142.

⁵⁴⁶ The original perforated grill of the mihrab, with only fragments remaining, is only documented on old photographs, because the grill was reconstructed, but its reconstructions do not correspond to the original characteristics of the grill.

⁵⁴⁷ Aslani suggests that the grills were somewhat pre-fabricated. Aslani 2014, 141.

⁵⁴⁸ The Urumiya mihrab is problematic, due to the high likeliness of its restoration and modifications in the Qajar period and it is therefore excluded from this discussion.



Figure 29: Detail showing the remains of the perforated stucco grill at the Pir-i Bakran mausoleum (third decorative stage; 1312-13).

The production method employed for the making of perforated stucco panels is difficult to comprehend, due to the lack of remaining grill fragments. The main issue comprises the fact that in all four cases, panels cover earlier stuccos and there is a considerable gap of empty space between the old and the new stuccos. This presented a problem to stucco carvers, who had to perforate a relatively solid layer of stucco panel. It is possible that these stucco panels were first produced and then installed in the desired locations. Craftsmen could have prepared a layer of stucco panel in a mould and kept it in a horizontal position when they carved and perforated it. Upon that, when the panel was still damp enough and it was possible to partially manipulate its form, the panel was inserted into its designated location and fixed to the adjoining panels or framing structures.

Combinations of Stucco Artistic Techniques

Figs. 30-31.

The described artistic techniques for stucco revetment production are in some cases combined to produce different types of stuccos. These choices of combination of diverse stucco artistic techniques and appearance of the final stucco revetment relief and its visual characteristics can be understood as the craftsmen's notion of production of stucco revetments. Listed below are some of the most frequently occurring combinations of stucco techniques and their visual effects with examples from the Ilkhanid stucco repertoires.

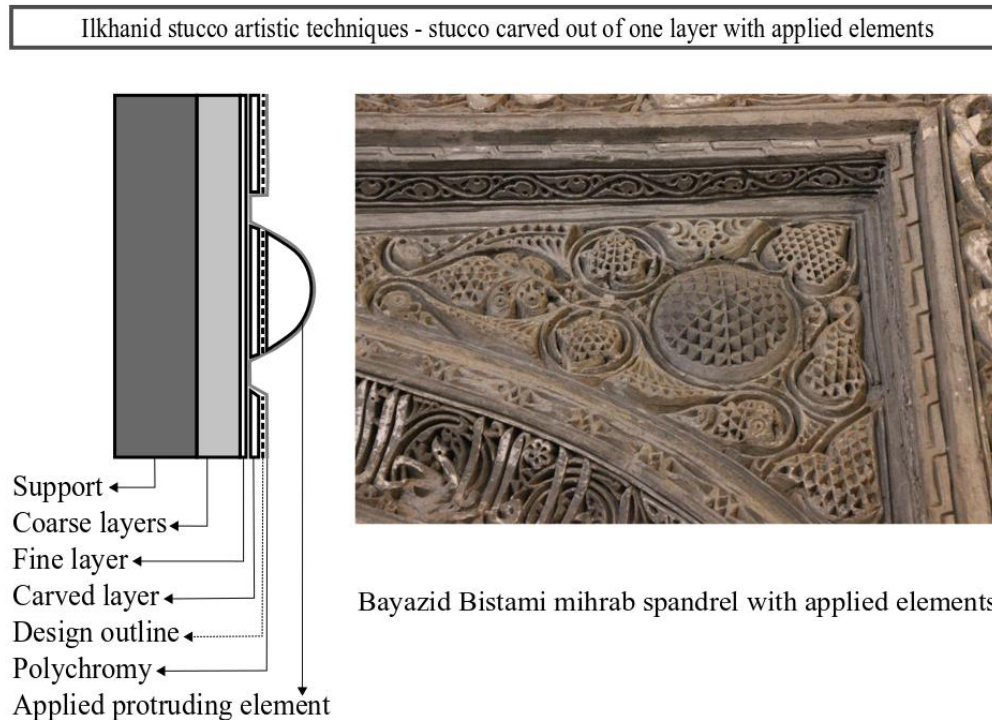


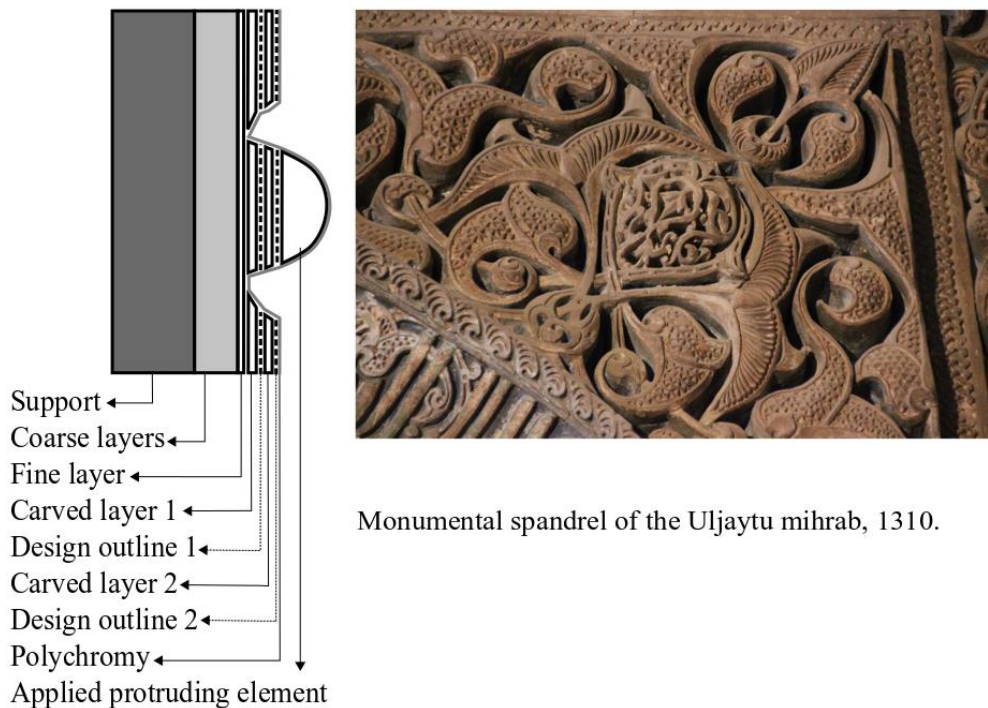
Figure 30: Schematic representation of stuccos produced by carving of one layer of stucco body and application of protruding elements.

One Layer Carved Stuccos with Applied Protruding Elements

Fig. 30.

This combination of two approaches to stucco revetment production is best illustrated in the upper register of the Bayazid Bistami complex mihrab (Cat. No. 19). The combination of the two techniques reflects the craftsmen willingness to deepen the visual appearance of the mihrab's relief and to render it more dynamic through the juxtaposition of two differing artistic techniques. In doing so, the craftsmen achieved a stucco revetment relief of contrasting one-plane carved stucco and circular geometric protruding inserts. These two combined artistic techniques determined the mihrab's more complex visual appearance and added to its visual depth by increasing the interplay of different forms and adding shadow and light effects to it. Similar combinations of stucco artistic techniques are found on the mihrabs signed by the Kirmani craftsmen (the Kucha-yi Mir mosque, the Turbat-i Jam complex, the Rabi'a Khatun Imamzada and the Mir Zabir mausoleum; Cat. Nos. 30-33).

Ilkhanid stucco artistic techniques - stucco carved out of two or more layers with applied elements



Monumental spandrel of the Uljaytu mihrab, 1310.

Figure 31: Stuccos carved out of two or more layers and addition of protruding elements – schematic representation.

Two or More Layer Carved Stuccos with Applied Protruding Elements

Fig. 31.

The Uljaytu mihrab in the Isfahan Friday mosque (Cat. No. 1) exemplifies combinations of various stucco artistic techniques. Craftsmen combined several approaches to stucco revetment production to achieve an extremely protruding, dynamic appearance of stucco relief for the mihrab's spandrels. They began their work with the carving of two or more fine layers of stucco in fan-forms resembling abstracted forms of leaf and palmette ornaments. The use of thick layers of stucco for carving these spandrels enabled the craftsmen to form their relief with extremely deep incisions and carving. The protruding parts of the ornamentation result visually light and dynamic, due to the use of deep and dense incisions and additional stucco perforation. These stucco panels were completed with the application of protruding pierced elements, which resemble bosses, but retain oval or teardrop forms. They were inserted in the carved relief on planned spots which were left uncarved by the craftsmen.⁵⁴⁹ The overall appearance of the spandrels is striking, because they feature an interplay of carved, incised and pierced horizontal and diagonal abstract floral forms, juxtaposed to round perforated planes of protruding bosses. Additional symmetrical disposition of the spandrels and use of applied bosses increased the mihrab's vertical symmetry axis.

⁵⁴⁹ Old photographic documentation testifies to the fact that these bosses were originally perforated and hollow, in similar manner to the reconstruction of their damaged parts.

Bevelled and Undercut Stucco Relief Combined with Stucco Perforation and Applied Protruding Elements

The Pir-i Bakran stucco revetments exemplify another specific combination of stucco artistic techniques, which combines the carving of several layers of stucco into a bevelled relief, which is undercut and heavily perforated, and its surface additionally embellished with the addition of floral lace-like elements.⁵⁵⁰ This combination of techniques was chosen by stucco craftsmen to achieve a distinct visual effect of these stuccos. Its characteristics comprise a non-protruding relief of bevelled appearance juxtaposed to undercut parts of stucco. The surface of stucco relief is rendered uniform through perforation of most of its surfaces, which assure its visually light appearance. Applied vegetal elements on the surface of the relief are directly juxtaposed to forms and design of the relief. The final visual effect comprises stuccos of highly abstracted forms, which are dynamic and at the same time of uniform appearance.

Pseudo-undercut Stucco Combined with Application of Protruding Elements and One Layer Stucco Carving

This combination of stucco artistic techniques is more complex and less frequently occurring. Its best example is in the Small mihrab of the Isfahan Friday mosque (Cat. No. 1) where abstract floral ornaments produced with pseudo-undercut stucco technique are placed in intervals between ornaments and are filled with applied protruding and heavily perforated circular bosses; the steady rhythm of floral ornaments and bosses constitutes the most protruding part of mihrab's horizontal register, which is set against a background of stucco carved out of one layer and the top horizontal register of the Farumad Friday mosque mihrab (Cat. No. 16). It illustrates the craftsmen's creativity in producing stucco revetments and mimicking the visual appearance of stuccos produced with use of different artistic techniques. The combination of these techniques is found in the upper register of the Small mihrab.

Conclusion

The examination of stucco revetment production technology and artistic techniques highlights the significance of the relationship between the craftsmen's knowledge to prepare the stucco body and to use distinct artistic techniques in order to produce diverse types of stuccos with differing visual characteristics and distinct aesthetic features. All discussed factors therefore need to be taken into consideration when assessing stucco revetments, their relationship to the architectural context, and when trying to understand their dating, function and meaning. Archaeometric research would provide further information regarding composition of different stucco revetment layers and the relationship between the mechanical characteristics of stucco revetments and their final appearance after carving in different modes is performed.

3.2 Carved Stuccos and their Original Polychrome Appearance

Background

Although scholars recognized the significance of Ilkhanid stucco revetments as one of the most important types of artistic expression of the Ilkhanid period, polychrome stucco,⁵⁵¹ one of the essential aspects of stucco revetments, remains almost unaddressed by Western Islamic Art historians. Only some recent publications discuss the question of painted Islamic revetments in

⁵⁵⁰ Similar combinations of stucco techniques are also found at the Haftshuya Friday mosque.

⁵⁵¹ Polychromy (from Greek: *poli* and *chromos* – many colours) is the practice of decorating (or better colouring) architectural elements and sculptures in a variety of colours.

Iran.⁵⁵² The situation is slightly different among Iranian scholars, where the polychromy received more attention in the field of archaeometric and art historical research (see the Appendix No. 1 to this Chapter).⁵⁵³

The cutting edge research by Vinzenz Brinkmann⁵⁵⁴ demonstrates the significance of polychromy studies for the understanding of original appearance and aesthetics of Ancient Greek sculpture and architecture. Further research of pre-Islamic polychromy on architectural revetments in Iran has been performed above all by Alexander Nagel.⁵⁵⁵ A more limited research of Islamic stuccos in Iran also provides some information regarding the use of colours for polychrome stucco revetments. For the Ilkhanid period only a small number of stucco repertoires retains a sufficient pigmentation amount to enable the understanding of craftsmen's colouring practices and notions. For the Ilkhanid stuccos a few reports referring to conducted archaeometric studies of polychrome stucco present results of a preliminary nature, although many of them employ outdated research technology and methodology. There is also a need to determine which types of impregnators were employed to treat the stucco surface (in order to reduce its porosity) prior to its colouring. Furthermore, information regarding material composition and use of binders for colour adhesion to the stucco surface is entirely lacking. It is also necessary to establish how colours were applied (thickness of layers and number of applications, colour mixing) to better understand the craftsmen's practices of stucco colouring. Information regarding the use of varnishes or patinas to protect the paint is absent. Gilding techniques also require scientific research for a better understanding of their material composition and gilding procedures. Provision of solutions to the outlined issues is far beyond the feasibility of this dissertation, due to the need for long-term archaeometric research, which would provide the necessary data. This section nevertheless attempts to provide as much information as possible, regarding Ilkhanid polychrome stucco, by drawing on existing archaeometric research of pigmentation traces of Ilkhanid stuccos and their *in situ* documentation.

a.) Ilkhanid Polychromy - Stucco Colours and Pigments

Fig. 32.

Preliminary archaeometric information allows the discussion of general characteristics and trends of pigment use for stucco colouring during the Ilkhanid period. The pigmentation of four Ilkhanid stucco repertoires have so far been researched: the carved stucco mihrab in the north-western prayer hall of the Friday mosque of Kashan (Seljuq or Ilkhanid?),⁵⁵⁶ the Uljaytu mihrab⁵⁵⁷ in the Isfahan Friday mosque (Cat. No. 1), the stucco revetments of the Pir-i Bakran⁵⁵⁸ mausoleum (Cat. No. 2) and wall painting and applied moulded and stencilled stuccos of the Rukniyya complex in Yazd (Cat. No. 29).⁵⁵⁹ The available data regarding material characterizations of Ilkhanid pigments has been summarized in the appendix to this chapter (Appendix No. 1).

⁵⁵² See, for example: Korn 2012; Hillenbrand 2014; Grbanovic 2017a; Grbanovic 2018a.

⁵⁵³ Karimy and Holakooei 2015; Younessi *et al* 2017; Isfahani *et al* 2010; Boroujeni *et al* 2013; Holakooei *et al* 2020; Holakooei *et al* 2018.

⁵⁵⁴ Brinkman 2010; Brinkmann 2003; Brinkmann and Brinkmann 2020.

⁵⁵⁵ Nagel 2010; Nagel 2013; Nagel and Douglas 2016.

⁵⁵⁶ Younessi *et al* 2015; Younessi *et al* 2017.

⁵⁵⁷ Isfahani *et al* 2010.

⁵⁵⁸ Holakooei 2007; Aslani 2014, 139-142.

⁵⁵⁹ Boroujeni *et al* 2013.

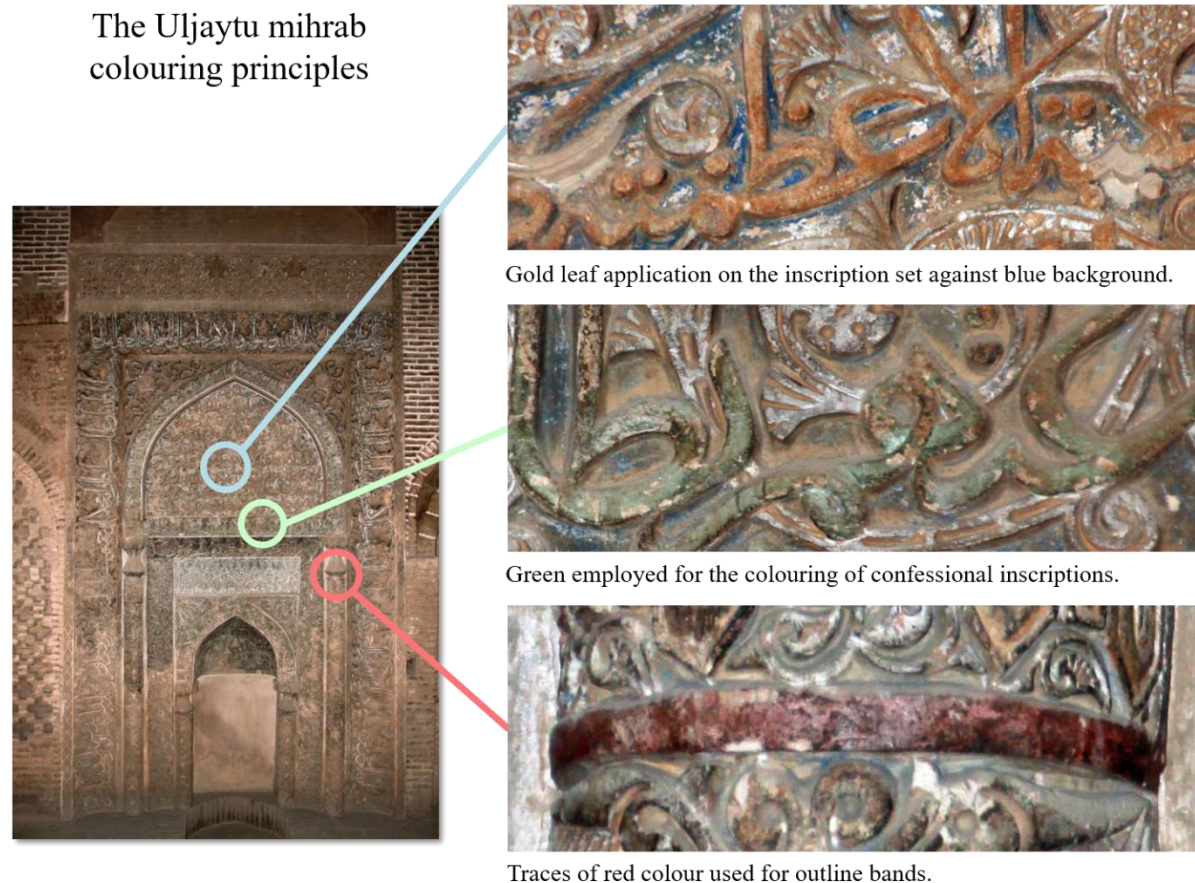


Figure 32: The Uljaytu mihrab (1310; Cat. No. 1) and detailed images of its polychromy remains (restored), illustrating some Ilkhanid stucco colouring principles.

Research of the carved monumental Kashan mihrab suggests that red lead (red), and lapis lazuli or azurite (blue) were used for its colouring.⁵⁶⁰ Data from the analyses conducted on the Uljaytu mihrab suggests that malachite was used for green (although the malachite could be the result of the chemical decomposition of azurite), azurite was used for blue, carbon was used for black, hematite and ferrous oxides (ochre) were used for orange and red, and gypsum was used for white.⁵⁶¹ Research of the Pir-i Bakran revetments from the second and third decorative interventions (1303-1313), indicates the use of hematite and ochre for red, azurite for blue and gypsum for white; its stuccos do not retain green.⁵⁶² The outlined information regarding material characterization of pigments on carved stucco repertoires informs which were the most common pigments employed for stucco colouring. Accordingly, it is possible to propose a preliminary list of Ilkhanid carved stucco pigments and some information about their origin.

Primary Colours

Primary colours indicate the main colours which Ilkhanid stucco craftsmen used for stucco colouring. These colours presumably consisted of as pure a pigment as possible, rather than a mixture of pigments which allowed for the production of derived colours.

⁵⁶⁰ Younessi *et al* 2017, 78-85.

⁵⁶¹ Isfahani *et al* 2010, 430-432.

⁵⁶² Holakoei 2007, 4-6; Aslani 2014, 139-142.

Blue

Archaeometric research suggests that the main source for the colour blue was azurite.⁵⁶³ Azurite⁵⁶⁴ is a mineral pigment, which is found in nature and consists of copper oxides. Existing data illustrates that azurite began to be used as a pigment for stucco colouring for the first time during the Ilkhanid period.⁵⁶⁵ In pre-Ilkhanid times, lapis lazuli was employed more frequently for blue shades.⁵⁶⁶ Lapis Lazuli was detected on wall paintings of the Rukniyya complex in Yazd, dated 1325.⁵⁶⁷ As both lapis lazuli and azurite are mineral pigments they had to be quarried. Lapis lazuli however originates in the Badakhshan area and it had to be imported to the centre of the Empire. It is also known as one of the most expensive pigments and sources state that in the Ilkhanid period, lapis lazuli reached prices higher than gold, due to its limited supplies and necessities of import. In contrast, azurite was a considerably cheaper pigment and its sources were more widespread. The mountain ranges close to Kashan are renown sources of this mineral which was also used for the preparation of colouring agents for tile revetments, as stated in Abu al-Qasim's treatise on lustre ceramics.⁵⁶⁸ It is thus possible to speculate that azurite became more frequently employed for stucco colouring because it was easier to obtain on the market and because it was cheaper.⁵⁶⁹ Blue, together with red and white is one of the most frequently employed colours for Ilkhanid stucco colouring.

Green

Malachite⁵⁷⁰ is the likely pigment for the green for stucco colouring during the Ilkhanid period. It is a naturally originating mineral pigment, but it can also be produced artificially with the process called *copper burning* by Abu al-Qasim.⁵⁷¹ Knowledge of the artificial production of malachite dates back to the Ancient Greek period. Tools discovered at Parthenon in Athens testify to the production of green pigments through mixing of copper metal with acids and sulphuric gasses. A similar procedure is described by Abu al-Qasim for the preparation of green pigments for pottery glazing.⁵⁷² Given that the natural sources of malachite during the Ilkhanid period were relatively scarce, it is plausible that stucco or specialized craftsmen were able to artificially produce the copper pigment. Green pigment has been spotted on a considerable number of the Ilkhanid stucco repertoires, for example: the Ushturjan Friday mosque mihrab (Cat. No. 4), the Haftshuya Friday mosque mihrab (Cat. No. 3), the Uljaytu mihrab (Cat. No. 1) and the wall painting in the Pir-i Bakran mausoleum (Cat. No. 2).

⁵⁶³ Parviz Holakoei, personal communication to the author.

⁵⁶⁴ See Roy 1993, Vol 2, 23-36.

⁵⁶⁵ Parviz Holakoei, personal communication to the author.

⁵⁶⁶ Lapis lazuli was for example identified in the pre-Seljuq wall paintings of the Isfahan Friday mosque and in the stucco revetments dating to 11th and 12th centuries at Nishapur, which shows that it was an often employed pigment. See Jung *et al* 2016, 87-88; Holakoei *et al* 2018, 191.

⁵⁶⁷ Boroujeni *et al* 2013, 101-03.

⁵⁶⁸ Allan 1973, 116.

⁵⁶⁹ Moreover, azurite was easy to work as a pigment and it was not difficult to achieve strong colouring effects through use of this pigment.

⁵⁷⁰ See Roy 1993, Vol 2, 183-202.

⁵⁷¹ Allan 1973, 111-120.

⁵⁷² Kashan as the lustre wares production centre demonstrates advanced knowledge and industry of ceramic and lustre wares production in both the Seljuq and Ilkhanid periods. The knowledge necessary for the production of lustre wares, preparation of lustre film components and specific requirements of reduction kilns for lustre burning is similar to the knowledge required for artificial production of green pigment. See Allan 1973, 111-120.

Red

Ferrous oxides⁵⁷³ (red ochre, hematite), red lead⁵⁷⁴ and vermillion⁵⁷⁵ (cinnabar – mercury sulphite) were identified as sources of the red colour on Ilkhanid stuccos. Hematite and red ochre were employed more frequently, perhaps because their sources were more widespread, but this might be also due to the fact that only a small portion of stucco pigmentation traces have so far been analysed. Vermillion was used for darker red shades because of the characteristics of this natural mineral, while ferrous oxides were used for bright red or orange-red. Resistance to sun light is stronger for ferrous oxide-based pigments, due to the strength of the molecular bonds formed between ferrous and oxygen elements.⁵⁷⁶ Pigments were likely of natural origin which is in line with the fact that there were numerous sources for these pigments in the territory of the Ilkhanid Empire. Red pigments, especially hematite and ochres, retain a long-standing tradition for stucco colouring starting at least in eleventh century Nishapur.⁵⁷⁷ In Ilkhanid stuccos, red was one of the most frequently employed colours for stucco colouring together with white and blue. Archaeometric research would be needed to ascertain use of red as stucco gilding support (bolus).⁵⁷⁸

Yellow

Yellow colour for stucco is attested on a few stucco revetment repertoires and it varies from bright yellow on stuccos of the Haftshuya Friday mosque (which however might be a result of decorative campaigns of the post-Ilkhanid period; Cat. No. 3) to more ochre-like pigments on the Uljaytu mihrab (Cat. No. 1). Analyses illustrate that in this case, the colour was achieved with yellow ochre, a type of ferrous oxide,⁵⁷⁹ which was already identified on earlier stuccos excavated at Nishapur.⁵⁸⁰ Yellow might have been a less frequently employed pigment, but this might be a deception caused by the fact that the pigment is more difficult to spot and more prompt to decomposition under sun light. Some Seljuq period stuccos at Zavara and Ardistan also contain traces of yellow, which might be yellow ochre.⁵⁸¹

White

White was often employed for Ilkhanid stucco colouring in several manners. It could have been used as a base coating for the polychromy repertoire, and it was therefore applied to stucco revetments prior to their colouring. White thus rendered the subsequently applied colours brighter and more opaque. This was especially desired for stucco repertoires which retained a darker colour of stucco body, caused by impurities in the gypsum stemming from its burning process and the gypsum deposits. White could also be employed independently to colour stucco revetments, most frequently in combination with red. Analyses show that gypsum⁵⁸² was used for white colour. This is a pragmatic choice, because the material was widely available, not

⁵⁷³ See Berrie 2007, Vol 4, 39-110.

⁵⁷⁴ See Feller 1986, Vol 1, 109-140.

⁵⁷⁵ See Roy 1993, Vol 2, 159-182.

⁵⁷⁶ It might be that these pigments were more frequently identified, because an extensive amount of them is preserved in comparison to pigments more prompt to decay or chemical break down such as vermillion. Author's observation.

⁵⁷⁷ Holakooei *et al* 2018, 188-190.

⁵⁷⁸ Parviz Holakooei, personal communication to the author.

⁵⁷⁹ See Berrie 2007, Vol 4, 39-110.

⁵⁸⁰ Holakooei *et al* 2018, 184-188.

⁵⁸¹ For the Zavara Friday mosque see Godard 1965, 292-293 and for the Ardistan Friday mosque see Qasimi, 2004, Vol. 7, 32-41.

⁵⁸² See Roy 1993, Vol 2, 203-244.

costly and it did not decay under UV light. Lead white, use of which is attested in periods earlier than the Ilkhanid,⁵⁸³ was logically avoided, because it was prompt to oxidation, turning its appearance grey or black.

Black

Similar to white, black pigment also constituted a pragmatic choice. Craftsmen were using charcoal - carbon pigment,⁵⁸⁴ which was easy to produce, not costly and widespread. The drawback of using this pigment was its relative instability and the need for the use of binders in order to fix the colour to its surface. Black was however employed for stucco colouring on a limited scale, most commonly to produce design outlines, such as in the case of the Uljaytu mihrab. Stucco reliefs were normally not coloured with black. Use of this pigment retains a long tradition and it has been identified in Nishapur's eleventh century stuccos.⁵⁸⁵

Derived Colours

Derived colours are colours created by craftsmen through the process of pure pigment mixing. There is extremely limited archaeometric information regarding pigment mixing in Ilkhanid stucco colouring. But indication of such practices is based on some preliminary archaeometric research and documentation and observation of stucco revetments *in situ*.

Dark red to purple shades on the Uljaytu mihrab might have been achieved by deliberately mixing or overpainting red and blue colours. Red was applied first and then it was painted over with more diluted blue. The described effect might however be the result of a later overpainting or an uninformed restoration intervention. Archaeometric research indicates that quite certainly, craftsmen mixed yellow ochre with red ochre or with hematite in order to achieve orange shades. This practice is also spotted on the Uljaytu mihrab. Pink colour shades are found on the Pir-i Bakran mihrab and it is possible that red pigment such as red ochre or hematite was mixed with gypsum in order to produce pink shades. Similar shades of pink were found on some stucco fragments excavated at Nishapur.⁵⁸⁶ Their archaeometric analysis revealed that pink in that case was a result of decomposition of the hematite under UV light. It is not yet clear whether Ilkhanid craftsmen mixed red and white colours to create pink, or if the spotted pink colour traces are results of decomposition of pure, complementary colours. Light blue is rarely spotted on Ilkhanid stuccos, apart from some exceptions. This shade of colour could have been achieved with the use of a different mineral pigment such as lapis lazuli, but it could also be created by mixing azurite and gypsum.

Ilkhanid Stucco Colour Palette and Pigment Use

Published archaeometric research indicates that the Ilkhanid selection of colours for stucco revetments comprised use of the following pigments: malachite for green, azurite for blue, hematite, red lead, vermillion and red ochre for red, yellow ochre for yellow, gypsum for white, and carbon black for black.⁵⁸⁷ These pigments are of mineral origin and the majority of them is

⁵⁸³ Karimy and Holakooei 2015, 393.

⁵⁸⁴ See Berrie 2007, Vol 4, 1-38.

⁵⁸⁵ Holakooei *et al* 2016, 190-191.

⁵⁸⁶ *Ibid.*, 190.

⁵⁸⁷ Research of Ilkhanid wall paintings illustrates a slightly wider spectrum of pigment selection for their production and it remains unclear if this difference is only caused by the fact that a very small part of pigment material has so far been analysed, or if the difference of the architectural revetment media impacted different selections of pigments. See Boroujeni *et al* 2013, 101-103.

likely to have been quarried in nature. It remains unclear whether malachite, due to its scarce supplies in nature, was artificially produced. Other pigments were likely of natural origin.⁵⁸⁸ Scarcity or lesser availability of some pigments might have impacted their less frequent use for stucco colouring. This might be the case for malachite. Moreover, the fact that lapis lazuli seems to have given way to azurite might not only reflect their difference in prices, but local availability of azurite, compared to lapis lazuli.

Comparison of the pigment selection for Ilkhanid stucco colouring demonstrates that the amount of pigments for stucco colouring was very restricted during the Ilkhanid period, if compared to earlier stucco production practices.⁵⁸⁹ As Holakooei and Karimy explain, the evolution of stucco revetment production techniques through a long chronological span, starting in pre-Islamic times, also comprised trial and error experimentations of pigment use for stucco colouring.⁵⁹⁰ Archaeometric research of earlier stucco indicates that a wide selection of pigments was used for colouring of stucco and terracotta revetments. This pigment palette gradually became more restrained in the Seljuq period and even more limited during Ilkhanid times. This is similar to the described continuity in stucco body preparation and stucco design making and transfer, spotted on stuccos of the pre-Ilkhanid periods and transmitted as knowledge to Ilkhanid stucco production. Ilkhanid stucco craftsmen also inherited the knowledge of pigment preparation and use for stucco colouring from their predecessors. The Ilkhanid pigment selection was likely modified as depending on geo-political context prices and availability of pigments during the Ilkhanid period.⁵⁹¹

b.) Ilkhanid Polychrome Stucco – the Artistic Technique

Pigment Preparation

After the craftsmen obtained pigment minerals, they had to prepare the colours for stucco colouring.⁵⁹² The necessary procedures can be speculated on based on the understanding of European medieval pigment preparation practices.⁵⁹³ The process began with grinding the mineral into a fine powder. For the grinding procedures a grinding support and grinding tool were needed. For support, a slab of marble or stone material, which was finely polished and thus rendered not porous, was used. The grinding tool had to be round and minerals were powdered by first hitting and then grinding motions. The quality of the colour depended on the fineness and purity of the powdered pigment. It is plausible that similar to ancient Greek practices, Ilkhanid craftsmen also sieved and filtered the ground pigments through filter jars containing different types of filters for differing particle sizes. Through this procedure, craftsmen purified pigments and removed impurities or larger particles from the pigment

⁵⁸⁸ Based on information on historic mines and mineral sources these pigments were available within the Ilkhanid Empire and they thus did not need to be imported from foreign lands.

⁵⁸⁹ Compare to Holakooei *et al* 2016.

⁵⁹⁰ Parviz Holakooei, paper delivered at the conference, *I Love Persian Stucco*, University of Bamberg, April 10-12, 2017.

⁵⁹¹ So far, there is no known written source on prices or sources of pigments for stuccos. The closest information concerning sources of pigments for pottery is provided by Abu al-Qasim in his Treatise. See Allan 1973. Yves Porter is working on this question for Ilkhanid pottery. Yves Porter, paper delivered at the Séminaire Medieval Kashi Online, November 30, 2021.

⁵⁹² Alternatively, independent pigment experts could have prepared the pigments and supplied stucco craftsmen with prepared pigments.

⁵⁹³ See Feller 1986; Roy 1993; West 1997; Berrie 2007.

powder. Difficulties of labour and the filtering process also depended on characteristics of received minerals, which contained varying amounts of impurities.

Colour Preparation

Once the pigments were ground and filtered, they were ready to be employed for stucco colouring.⁵⁹⁴ Powdered pigments required an agent to render them liquid and to make them adhere to the stucco surface. The type of pigment determined the sort of necessary binder and the modality of pigment use for stucco colouring. For Ilkhanid stuccos the earlier section illustrates that the identified pigments in stucco polychromy repertoires were of mineral origin. Differently to floral origin pigments, mineral pigments required a dry, rather than wet application onto the desired surface. Accordingly, the stucco relief had to be dry at the time of colouring and it had to be rendered less porous for the colour to remain on its surface. Wulff suggests use of oils such as linseed for stucco impregnation, but archaeometric research would be necessary to confirm this hypothesis.⁵⁹⁵ For mineral pigment binding, three different groups of binders exist: wax (encaustic painting), tempera binders (water soluble) and siccative oils. Selections of mineral pigments found on Ilkhanid stuccos and the preliminary binder research reveals that tempera binders had to be used for stucco colouring. The artistic technique for carved stucco colouring was accordingly the tempera technique.

Possible Colour Binders

Identification of Ilkhanid and other stucco polychromy binders⁵⁹⁶ is one of the major gaps in the understanding of polychrome stucco and artistic techniques.⁵⁹⁷ Some preliminary information obtained by archaeometric chemical analyses suggests possible sources of binders for stucco colouring. Preliminary research of the Pir-i Bakran stucco pigments suggests the presence of proteic substances, pointing towards animal origin binding agents.⁵⁹⁸ Research by Karimy also revealed that it is most likely that some type of animal glue was used as pigment binder for stucco colouring.⁵⁹⁹

The following binders could be used for stucco tempera polychromy: tempera on glue (animal glue), tempera on egg, tempera on casein and fat tempera (combination of egg and oils). If the technique was gouache, binders could comprise vegetal gums or amids. Both, tempera and gouache were water soluble binders, while there were also possibilities of the use of binders insoluble in water such as wax (encaustic painting), resins or siccative oils. Mineral pigments required a water soluble binding agent in order to break the chemical molecules of mineral crystalline structure and to form new molecular bonds. The advantage of using animal glue or casein, instead of oil or egg, was that it was a stronger binder or it reacted better with minerals. Casein is produced through the thermic processing of milk and it reacts well with magnesium and calcium to make strong bonds and renders surfaces hydrophobic. Therefore, animal glue or casein are the most likely binders for Ilkhanid stucco colouring.⁶⁰⁰ Material for the production of animal glue (from joints and muscles of herbivore animals) and casein (animal milk) was

⁵⁹⁴ See Rubio Domene 2010, 110-112.

⁵⁹⁵ Wulff 1966, 135.

⁵⁹⁶ For binders in use in Medieval Europe, see Perusini 1985, 185-188.

⁵⁹⁷ This is due to the fact that as binders are organic, they are very challenging to extract from the stucco polychrom body and to be analysed. Compare Rubio Domene 2010, 107-110.

⁵⁹⁸ Holakooei 2007, 9-10.

⁵⁹⁹ Amir Hossein Karimy, personal communication to the author.

⁶⁰⁰ This hypothesis would nevertheless require extensive archaeometric research in order to ascertain its correctness.

present in the territory of the Ilkhanid Empire, as opposed to specific resins which had to be imported.⁶⁰¹ Iranian written sources do not contain recipes or procedures for colour binder production.

Colour Application Practices

The discussion of published archaeometric research is informative on the Ilkhanid stucco colouring practices and pigment use. The Ilkhanid stucco colouring palette consisted of primary colours, which were preferably used in the form of pure pigments, but colour mixing for more elaborate shades and to create a wider colour spectrum, was also practiced. Researchers note that colours were applied on the stucco relief of the Uljaytu mihrab in three layers and propose that the stucco craftsmen applied several colour layers in order to achieve a more opaque appearance of colours and a stronger colouristic effect on the mihrab.⁶⁰² Furthermore, the Haftshuya polychromy pigmentation traces provide evidence for use of white to create the light coloured base coating for application of paint. Without the basic white layer, the appearance of green pigments would not be so strong, due to the brownish colour of the stucco relief, typical of the Isfahan area.

Varnishes

After finishing colouring the stucco, the craftsmen proceeded to varnish the polychrome surface.⁶⁰³ The function of varnish was two-fold. It protected the polychrome stucco from mechanical damage and dirt and it prevented the darkening of the pigments more prone to oxidation, by eliminating their contact with air.⁶⁰⁴ Considering the types of pigments employed by the Ilkhanid craftsmen, it is likely that varnishing practice constituted an integral part of the stucco colouring artistic technique. The same applies to gilding, especially if gilding was performed with the application of silver leaf, prone to oxidation. Among pigments, vermilion⁶⁰⁵ is one of the pigments most prompt to oxidation and darkening together with white lead, which was however not used for Ilkhanid stucco colouring exactly for this reason. Substances employed for stucco varnishing were likely different types of hard and soft resins.⁶⁰⁶ Most commonly used hard resins comprise coppale and amber and most common soft resins include mastic and dammar. The majority of listed resins were not locally available in Ilkhanid Iran and they would have to be imported. Two possibilities therefore emerge: either the varnishes were acquired through international trade from areas such as modern Egypt or Yemen, or similar varnishing properties were sought in the locally grown plant species. But it is more plausible that varnish material was imported because use of such material would reflect the standardized practices.

⁶⁰¹ One of the oldest recipes by Cennino Cennini (end of 14th century) illustrates in details production procedures for animal glue and explains that wild hare or domesticated rabbit were some of the most appropriate animals for animal glue production. For resins as binders see Rubio Domene 2010, 107-110.

⁶⁰² Isfahani *et al* 2010, 340-341.

⁶⁰³ For European Medieval practices of varnishing, see Perusini 1989, 283-286.

⁶⁰⁴ No archaeometric research regarding practices of stucco polychromy varnishing exists and this aspect of the artistic techniques requires an in depth research.

⁶⁰⁵ This issue was for example resolved in Pompeii through the use of encaustic painting techniques, which embedded vermilion into wax and therefore prevented its contact with air and consequent oxidation.

⁶⁰⁶ See Rubio Domene 2010, 107-110.

c.) Ilkhanid Stucco Gilding Technique

Fig. 33.

Stucco revetment repertoires dating to Ilkhanid period, such as the mihrab and the dated tomb chamber stucco panel (1303-04) at the Pir-i Bakran mausoleum (Cat. No. 2), and the Uljaytu mihrab (Cat. No. 1) retain extensive evidence demonstrating that their stucco surfaces were gilded.⁶⁰⁷ Moreover, the second decorative phase of wall painting and applied moulded and stencilled stuccos in the interior of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) also retain extensive gilded stucco surfaces. Gilding has also been documented on wall paintings and applied moulded and stencilled stuccos in the interior of the Rukniyya complex in Yazd (1325; Cat. No. 29).⁶⁰⁸ These repertoires indicate that Ilkhanid stucco craftsmen in some cases gilded architectural revetments.⁶⁰⁹ Gilding artistic technique was combined with stucco colouring and gilding came to constitute an important aspect of stucco polychromy repertoires. It is plausible that gilding could have been performed by external experts rather than the stucco craftsmen.⁶¹⁰ The only known pre-Ilkhanid revetments, the wall painting remains discovered at the Isfahan Friday mosque and the Tabriz Friday mosque, dating to pre-Seljuq times, indicate that this artistic technique was also known in considerably earlier periods. Some preliminary evidence indicates that pre-Ilkhanid stuccos may occasionally have been gilded.⁶¹¹ Carved stucco revetment gilding may be an Ilkhanid invention, or it was at least employed more frequently on Ilkhanid stuccos. The long-standing tradition of gilding in manuscript illumination testifies to the existence of gilding knowledge and techniques across an extensive time span and a wide geographical context. The Lajvardina ceramic technique, the invention of Ilkhanid potters, also comprised gilding of tiles with a similar approach and technology. But manuscript and tile gilding was performed on considerably smaller surfaces, compared to Ilkhanid architectural revetments. Use of gilding for carved and applied moulded and stencilled stuccos was thus a demanding and time consuming labour, because it required for the large surfaces to be gilded *in situ*, at the time of production of architectural revetments.

Stucco gilding artistic technique was more similar to gilding for Lajvardina tiles,⁶¹² than manuscript illumination. While manuscripts comprised small surfaces of illuminated elements, stuccos required an artistic technique and material sufficient to cover substantially more extensive surfaces with gold, silver or other metal leaf. The type of support, paper for manuscripts and impregnated stucco surface for stuccos, required specific binding agents and diverse types of preparation of surfaces for gilding. In sum, various gilding techniques were employed by Ilkhanid craftsmen to gild Lajvardina tiles, for manuscript illumination and to gild architectural revetments in stucco media.

⁶⁰⁷ Gilding artistic technique is a technique in which revetments or objects were gilded by applying gold, silver or other metal substances (in liquid or leaf form) onto the surfaces of objects or architectural revetments. The term gilding does not necessarily involve the application of gold material onto these surfaces; it is the name of the technique.

⁶⁰⁸ Boroujeni *et al* 2013, 101-103.

⁶⁰⁹ Some information regarding the technique of stucco gilding is provided by Aslani. See Aslani 2014, 292.

⁶¹⁰ This is indicated by the relatively limited occurrence and spread of stucco gilding.

⁶¹¹ Amir Hossein Karimy and Parviz Holakooei report to have found remains of stucco gilding at the Sin Friday mosque. Personal communication to the author.

⁶¹² The origin of this technique might have been connected to the earlier *Mina'i* technique.



Gilded tile fragment excavated at Takht-i Sulayman. Berlin MIA, 1.4/67.22.

Gilded stuccos of Uljaytu's mausoleum at Sultaniyya (1313-1316/20).



Gilded stuccos of the Pir-i Bakran mausoleum, second decorative phase: 1303-04.

Figure 33: Some examples of Ilkhanid architectural revetments' gilding practices.

Gilding of extensive stucco surfaces was not expensive in terms of material, but it required a considerable amount of manual labour.⁶¹³ Gilding stuccos was thus possible for commissions with wealthy endowments. Drawing on extant examples, Ilkhanid stucco gilding practice can be dated to the first years of the fourteenth century. Lack of archaeometric research for stucco gilding makes it difficult to reconstruct this stucco gilding artistic technique(s), but some information can be proposed based on observations of gilded stucco revetments *in situ*, their comparison to medieval European gilding practices and by building on archaeometric research of gilding techniques in manuscripts and a wider geographical and chronological context.

Ilkhanid Stucco Gilding Technique

A considerable number of different gilding artistic techniques were widespread in mediaeval Europe.⁶¹⁴ Moreover, some information concerning gilding of Islamic stuccos in Spain is provided by Rubio Domene.⁶¹⁵ Gilding techniques are distinguished based on types of gilding support and modalities of gold application and working.⁶¹⁶ For gilding, gold leaf was often substituted with other metal leaves simulating golden, silver or copper colours, with the main components of tin, silver or copper.⁶¹⁷ For Ilkhanid stucco gilding, the technique employed by

⁶¹³ For example, to prepare the metal leaves for gilding, to prepare the gilding surface and to perform gilding. This also required use of specific gilding tools.

⁶¹⁴ See Perusini 1985, 113.

⁶¹⁵ See Rubio Domene 2010, 112-114.

⁶¹⁶ The main techniques comprise: liquid gold application (for small surfaces, such as manuscripts), bole gilding (for wood, stucco, wall painting, tile supports), surface perforation (surface perforation of gilded areas to create repeating punctured patterns, mainly for wood support) and mordant gilding (for wooden support).

⁶¹⁷ Rubio Domene 2010, 114.

the craftsmen can be broadly associated with the medieval European gilding technique of bole gilding.⁶¹⁸ Bole gilding is one of the oldest gilding techniques which began to be employed in Europe around 1200.⁶¹⁹ Ilkhanid stucco gilding reveals characteristics of this technique, but each revetment repertoire has slightly different traits. Ilkhanid stucco gilding procedures might have varied between craftsmen's workshops and were therefore less uniform in comparison to more standardized medieval European practices.

Stucco Gilding Support

After having rendered the stucco surface less porous for polychromy application, the stucco craftsmen first applied a binding agent for gilding, which functioned as the gilding support. The Pir-i Bakran stuccos retain evidence of a red coloured support which resembles the European bole. A similar type of support is also found at Sultaniyya, where it is darker in colour, suggesting that a different material was used, either because it was locally available or due to the craftsmen's practices. The Uljaytu mihrab would require more detailed investigation to state what kind of support was used. These cases may indicate use of a support similar to bole gilding.⁶²⁰ Bole was a layer of clay-containing substance, coloured red due to the presence of ferrous oxides, with a rather greasy constitution. The surface was polished smooth to enable good adhesion of the gold leaf. Bole gilding did not require any outlines for the application of bole or metal leaves. Painted outlines found on stucco inscription surfaces, which were gilded, did not have a function connected to the gilding process, but served for the carving of stuccos.⁶²¹

Application of Metal Leaves

Production of gold or other metal leaves required the metals to be worked with a specific type of a hammer and to be beaten into thin leaves. The golden, silver, tin or copper leaves were stored in book-like objects and separated by fine layers of paper, because they were electrostatic and fragile. The process of beating metal into leaves was extremely laborious, but the required amounts of gold or other metals for stucco gilding were relatively small, in comparison to the surface they could cover. A special fine brush was employed to transport gold leaves from the book onto the prepared surface and attach them. This was followed by the burnishing process which comprised burnishing of golden leaves with a tool of agate stone or animal (wolf or similar) tooth. Burnishing made the metal leaf adhere to the revetment surface. Burnishing required an immense amount of manual labour.⁶²²

Stucco Gilding Varnishing

Upon the completion of the burnishing process the craftsmen had to varnish⁶²³ the gilded areas with varnishes likely produced out of resins. This procedure served to protect the gilding from

⁶¹⁸ Other expressions for this technique comprise *doratura a guazzo* and *doratura a bolo*. Perusini 1985, 113.

⁶¹⁹ It is therefore also possible that the knowledge for this gilding techniques originated in Europe from where it spread eastwards, or vice versa.

⁶²⁰ In Europe wooden supports for altar pieces first had to be treated and a layer of calcium sulphate had to be applied and only subsequently it was covered with bole. This was of course not necessary in the case of Ilkhanid stuccos, because the supporting surface consisted of gypsum.

⁶²¹ These outlines were covered with the preparation and gold leaf. Their function was to present outlines of stucco (inscription) design on the stucco surface to guide the stucco carver during the stucco relief carving process. The outlines were not removed after the stucco carving process, because the craftsmen knew that they will be concealed to the viewer through the stucco gilding process.

⁶²² The process had to be repeated several times in order to cover all the small gaps of the revetment and it had to be repeated in places where the gold did not adhere well to the support.

⁶²³ In Italian the procedure is called *velatura*.

aging and oxidation which would alter its colour and shine unless the employed gold leaf was pure.⁶²⁴

Ilkhanid Stucco Gilding Practices

The Pir-i Bakran Mausoleum - Gilding (1303-04)

Gilded parts of the Pir-i Bakran mausoleum's mihrab (Cat. No. 2) comprise the two inscriptions in the monumental framing band of the mihrab. Both inscriptions, the *Thuluth* inscription recounting *Surat al-Insan* and the small Kufic inscription recounting *Surat al-Baqara*, are gilded. These gilded inscriptions are set against a dark blue background. The gilding is slightly oxidized and it also reveals cracks, which are the results of aging gilding. Beneath the gold film, it is possible to see the red layer of preparation, which was applied for the adhesion of gilding. Gilding was used to render the two inscriptions more visible, especially because they were set against a dark blue background. It increased the ease of reading the inscriptions for the literate audience. Gilding application also reflected the sanctity of inscription and thus gave them the most elevated status in the hierarchy of mihrab's epigraphic programme. At the carved stucco panel in the burial chamber of the mausoleum, the epigraphic elements consist of a monumental historic *Thuluth* inscription and a Kufic inscription (*Surat al-Fatiha*) in the background. Only the *Thuluth* inscription is gilded, while the Kufic inscription is coloured red. The inscriptions are set against a dark blue background. The background floral elements are also gilded. The historic *Thuluth* inscription is given better visibility and legibility by means of gilding. Gilded inscriptions at Pir-i Bakran are located above head-height. Use of gilding must have been deliberate and aimed at the spectators. It was easier for them to spot and read or at least perceive the presence of these inscriptions once they were gilded.

The Uljaytu Mihrab - Gilding (1310)

The Uljaytu mihrab retains extensive traces of gilding combined with stucco colouring. Two types of metal leaves were used for its gilding: gold and likely silver leaf (or tin leaf). Gilding is almost exclusively used for inscriptions of the mihrab's repertoire. The largest monumental Hadith framing inscription was originally covered with silver or tin leaves.⁶²⁵ Inscriptions in *Thuluth* style, the main historic inscription in the mihrab's lunette, and the lower framing Hadith inscription, retain traces of gilding. The Uljaytu mihrab likely comprised the application of two different metal leaves, which must have been aimed at creating the interplay between shiny gilded surfaces and opaque coloured remaining surfaces of its relief. The combination of silver and gold leaf application is a unique case in the existing Ilkhanid stucco repertoires. This can either be explained by the fact that the mihrab installation was a high-profile commission, with an extensive budget which required specialists in gilding to be employed. It was however craftsmen who must have decided which parts of the mihrab were going to be gilded, in order to acquire a specific colouristic scheme for every mihrab's panel. In this respect it might be likely that gilding pre-determined the choice of colour combinations for polychrome schemes of the mihrab's panels.

⁶²⁴ Impure gold and silver leaf for gilding were prone to oxidation. Use of varnishing for stucco gilding must be attested with future archaeometric analyses.

⁶²⁵ It is not clear whether some of the floral scrolls of the mihrab and other inscriptions were also covered with silver leaf, due to excessive interventions on the mihrab's colour scheme.

Uljaytu Mausoleum at Sultaniyya - Gilding (the second decorative phase: 1313-1316/20)

Revetments of the second decorative stage in the interior of the Uljaytu mausoleum's octagonal core were produced with a combination of wall painting and applied moulded and stencilled stucco techniques with gilded stuccos. Two types of gilding are found: the teardrop-formed monumental medallions, below the dome of the mausoleum and some arabesque framing bands running along the supporting walls of mausoleum's interior. In both cases gilding is not aimed at inscriptions, but floral ornamentation. It might simply be that craftsmen wanted to render the repertoire more sumptuous and to show the wealth of the patron through gilding extensive applied moulded stucco surfaces. Many of these surfaces were located away from the viewer's eyes, on elevated positions and gilding rendered them more visible. The framing bands which were gilded also emphasized architectural lines of the mausoleum's interior. Gilded parts were more visible because they were distinguished from wall paintings which covered most of the mausoleum's interior architectural surfaces.

Conclusion

Discussed examples of Ilkhanid stucco gilding provide evidence concerning the craftsmen's logic for use of gilding in widening the stucco polychromy scheme which should be considered one of the characteristics of Ilkhanid stuccos. At Pir-i Bakran (Cat. No. 2) and at the Uljaytu mihrab (Cat. No. 1) the most extensive amount of gilded stucco comprises monumental inscriptions. But the Pir-i Bakran inscription lunette contains the monumental historic inscription, which is gilded, and parts of its floral background are also gilded. At Sultaniyya, gilding is employed in a distinct way; inscriptions are not gilded, but big teardrop medallions of abstract floral form and other arabesque framing bands are gilded. These differences in gilding notion between the Pir-i Bakran and Uljaytu mihrab, and the Sultaniyya, can be assigned to the use of different media of architectural revetments and also different craftsmen's workshops. Moreover, the architectural space of the Sultaniyya mausoleum is different and the distance between teardrop medallions in the transitional zone, just under the dome, required gilding to be employed in order to highlight their elaborate designs. Gilding at Sultaniyya might have been determined by its prominent patron.

d.) Stucco Craftsmen's Colouring Principles and Notion

Background

This section examines the craftsmen's principles of colour use for stucco colouring and the relationship between the carved stucco revetment relief and the colours applied on it, which determined the final visual appearance of stucco revetments. It is based on stucco revetment observations. To provide precise information regarding this important artistic procedure, the section contains an examination of the different cases of polychrome stucco. Firstly, it discusses cases of modern alteration of the colours of the stuccos. This enables the distinction between stuccos with original colours and those where their colours was altered. Secondly, the discussion focuses on a few cases of stucco revetments with relatively original polychromy traces. Thirdly, for the purpose of contextualized discussion, selected examples of pre-Ilkhanid stucco revetments are discussed.

Stucco Overpainting

Overpainting of stucco repertoires is a commonly occurring phenomenon in most of the stuccos *in situ*, in the Iranian territory.⁶²⁶ The most prone to overpainting are stucco repertoires in historic religious structures which still retain their original function.⁶²⁷ These interventions are mostly performed with modern colours, which are not reversible. If stuccos retain original polychromy traces, their entire surface is normally overpainted. Two types of overpainting can be spotted: whitewash and colour refreshment. Mihrabs are most commonly overpainted and following mihrabs, revetments near them, are also prone to overpainting. Overpainting is normally limited to the areas of architectural spaces, which can be reached from the floor, without the need for scaffolding. There are however exceptions to the rule, where for example conservators, during extensive restoration interventions, such as at the Sujas Friday mosque (Cat. No. 35), took the decision to refresh the colours of the entire decorative programme, in order to enhance their original aesthetics.

Whitewash

The practice of whitewash comprises painting the architectural surfaces or revetments, such as stuccos or wall paintings, with white colour.⁶²⁸ For Ilkhanid stucco revetments, their whitewashing is aimed at renewing the appearance of stuccos in uniformly white aesthetics. The whitewashed effect could have suggested a Neoclassical conception of stucco revetment appearance⁶²⁹ and it was in fact desired by the local authorities, communities or congregations.⁶³⁰ Whitewashing can be performed with the application of modern white colour or with calcium hydroxide –lime. Paradoxically, in some cases, the whitewash aided the preservation of original polychromy traces on stuccos, which it concealed. It is not clear when this practice became widespread, but according to some testimonies, some stucco repertoires were whitewashed in 1960s or 1970s. Some of the best examples of modern whitewash on stuccos are located in the Seljuq Sangan-i Pain Gunbad mosque,⁶³¹ the stuccos of the Bistam Friday mosque and the Kashana tower (Cat. No. 18) and the mihrab of the Farfan Friday mosque (Cat. No. 5).

Stucco Polychromy Refreshment

Polychromy refreshment has the same function as whitewash: to render a repertoire of architectural revetments uniform and aesthetically appealing to the faithful. Polychromy

⁶²⁶ For Ilkhanid stuccos, stucco overpainting was documented at the following monuments: the Qum mausolea (Cat. No. 15), the Marand Friday mosque mihrab (cat. No. 22), the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), the Rukniyya complex (Cat. No. 29), the Imamzada Rabi'a Khatun mihrab (Cat. No. 32), the Mir Zabir mausoleum (Cat. No. 33) and the Sujas Friday mosque (Cat. No. 35).

⁶²⁷ The majority of overpainting interventions therefore do not respect basic principles of restoration of minimum intervention, legibility and recognition.

⁶²⁸ Whitewashed stuccos have been documented at: the Farfan Friday mosque (Cat. No. 5), the Kuhpaya Friday mosque (Cat. No. 8), the 'Abd al-Samad complex in Natanz (Cat. No. 12), the Baba Afzal mausoleum (Cat. No. 14), the monuments of Bistam (Cat. Nos. 18-19), the Jawin Friday mosque (Cat. No. 20), the Urumiya Friday mosque (Cat. No. 23) and at the Khizr mausoleum in Hamadan (Cat. No. 37).

⁶²⁹ This Neoclassical concept has roots in Winckelmann's writings about Classical architecture. It likely reached Iran and its monuments with European travellers or first restoration interventions in the first decades of the twentieth century. The field research of the monuments traced the majority of whitewashing activities to the 1960s and 1970s interventions.

⁶³⁰ In some cases the individuals stated that this is the way stucco revetment originally looked like or that they would like their monument to be whitewashed again. From the field research by the author.

⁶³¹ See Korn 2010.

refreshment is normally performed on architectural repertoires which still retain their original colours. This procedure comprises their overpainting, and painting of their missing parts, the lacunae, in the same colour shade in order to ultimately recreate the original design of the entire revetment repertoire. Such actions can result in the complete alteration of the original polychromy characteristics of the architectural revetments. Some examples of carved stucco polychromy refreshments are stuccos at the Pir-i Bakran mausoleum (the mihrab might have been repainted, Cat. No. 2), the Uljaytu mihrab (Cat. No. 1),⁶³² stuccos of the Imamzada Yahya in Varamin (Cat. No. 36), and especially stuccos of the Imamzada Ja'far and the Bagh-i Sabz mausolea at Qum (Cat. No. 15).

Original Polychromy Repertoires

Examination of whitewash and colour refreshment interventions reveals trends in stucco polychromy treatment and contributes the knowledge necessary to identify stucco revetments with original polychromy traces. In the absence of archaeometric data, one has to rely on the examination of stuccos *in situ* and one's skills in recognising original from altered paint. The majority of stucco repertoires with extensive original polychromy repertoires comprise above all stucco revetments located in dark interior spaces, where they were protected from direct light and water infiltration. Discussion of some selected stucco repertoires with extensive polychromy remains sheds light on the characteristics and patterns in the use of colours for stucco painting. Some earlier repertoires are also discussed in order to contextualise the examination.

Comparanda: the Pir-i Hamza Sabzpush Mausoleum

The mihrab of the Pir-i Hamza Sabzpush mausoleum in Abarquh, dating to the second half of twelfth century, is one of pre-Ilkhanid stucco repertoires which retains an extensive amount of its original polychromy, which was analysed with archaeometric methods.⁶³³ The colour scheme choice for every part of mihrab is likely to have depended on employed stucco artistic techniques and ornamental characteristics of stucco reliefs, the visual appearance of which was transformed through polychromy application. Light blue is used on the majority of mihrab's panels and it is exclusively applied on recessed parts of the stucco relief in order to constitute for a unified background of mihrab's relief. White and red were employed to colour protruding parts of the relief, most frequently of abstract floral or geometric elements. Ochre was used for colouring of the majority of mihrab's inscriptions, which result well visible, because they are set against a blue background. The mihrab reveals extensive use of green, which is combined with blue. Green is employed for colouring of floral leaf-like ornamentation, especially in the interior niche lunette of the mihrab. Craftsmen deliberately used contrasting and differing colour schemes for stucco panels, in order to juxtapose them to each other. In doing so, the mihrab acquired a more three-dimensional appearance and its stucco relief appeared deeper. Ochre colour rendered mihrab's inscriptions well visible and abstract protruding elements also acquired visibility through their colouring with contrasting colours.

The Pir-i Bakran Mausoleum

Two essential parts of Pir-i Bakran stucco revetments (Cat. No. 2) retain extensive amounts of stucco colouration: the mihrab and the dated lunette panel in mausoleum's tomb chamber. Both

⁶³² Detailed research of the history of restoration interventions on the Uljaytu mihrab indicates that some of these interventions, performed prior to 1970s also seem to have contained activities of refreshment of mihrab's stucco polychromy.

⁶³³ See Karimy and Holakooei 2015.

revetments are associated with the same decorative intervention dated 1303-04. Their polychromy and colouring logic support the hypothesis that they were produced by the same workshop. Both revetments display a similar use of colours for stucco colouring and the same colour palette. At Pir-i Bakran, the colour palette is more restricted, compared to the Uljaytu mihrab (Cat. No. 1) or colour traces found on other Ilkhanid stuccos. It consists of red, white, blue and gold.

The lunette panel with the historic inscription is located in mausoleum's burial chamber; it is a stucco panel where dark blue is used for its background and the remaining parts of the stucco relief are covered with brighter colours in order for them to stand out from the background. The described contrast increases the visual depth of the stucco relief. The main inscription and the floral ornaments are gilded and the smaller Qur'anic inscription was coloured red. Moreover, contrasting colours of two inscriptions which are juxtaposed, eased the possibility of reading the inscriptions. Craftsmen consciously aimed at emphasizing the visibility and legibility of the epigraphic content of the panel, which is placed on a slightly elevated location. The Pir-i Bakran mihrab reveals colouring principles similar to the described dated lunette in the tomb chamber.

Although the colour palette at Pir-i Bakran was more restricted, compared to other Ilkhanid stuccos, the craftsmen maintained the core principles of stucco colouring notion and achieved the desired colouristic and visual effects with a lesser number of colours. It is not clear why the chromatic spectrum of the mihrab was restricted. It might have been caused by shortage or higher prices of other pigments, or the need for their artificial production, which was beyond the feasibility in the given commission.

The Ushturjan Friday Mosque (c. 1315-16)

Stuccos of the *qibla* wall in the domed prayer hall of the Ushturjan Friday mosque (1315-16; Cat. No. 4) retain an extensive amount of stucco polychromy.⁶³⁴ The stucco revetments in the *qibla* lunette of the transitional zone form a panel. They are coloured with red, white and blue. Blue is used for the stucco relief background and red and white, in a manner similar to the Pir-i Bakran mihrab (Cat. No. 2), for protruding abstract ornaments of the panel. The inscription band above the transitional zone lunette retains a blue background and the inscription might have been coloured white. These stuccos feature a more restricted polychromy palette consisting of only three colours, which contrast the stucco revetments on the lower locations.

The stucco panel topping the mihrab, in a disjointed manner and likely an afterthought, if not a later addition to the stucco repertoire, presents a different approach to stucco production and colouring. Its most extensive pigmentation traces are white and green. White might have been used to cover the stucco surface and to render the colouristic effect brighter and more contrasting, in a manner similar to the Haftshuya mosque mihrab (Cat. No. 3). The lowest part of the *qibla* wall stucco revetments, the actual mihrab, displays two artistic techniques. The majority of the mihrab is produced with applied moulded and stencilled stucco techniques and only parts of the mihrab constitute carved stucco revetments (the spandrels). The spandrels retain extensive traces of green and red.⁶³⁵ Parts of the mihrab with applied moulded stuccos retain traces of blue, white and red. Blue is employed for the inscription band background, but

⁶³⁴ Discussion of characteristics of the Ushturjan stuccos presented in this dissertation hypothesize that the *qibla* wall revetments were executed as two to three separate interventions, by at least two different craftsmen workshops. Observations of their polychromy presented here seem to confirm this hypothesis.

⁶³⁵ Red could have constituted the stucco design outline for carving and not the final polychromy scheme.

it is shaded. This approach was not spotted on carved stuccos and it might be characteristic of the different artistic technique. White is used for some inscriptions and red for the design outline. The mihrab therefore differs in its polychromy scheme from the transitional zone lunette, the inscription band and also from the register which tops it.

The three described stucco revetments at Ushturjan display approaches to stucco colouring similar to those found in the other monuments. Interestingly, the entire stucco repertoire, as shown, does not display use of the same colour palette. As suggested, this variation might have been caused by the fact that these stuccos were not produced at the same time, or that different craftsmen produced them. Further differences stem from the fact that different artistic techniques are employed for their production.⁶³⁶

The Uljaytu Mihrab (1310)

Stucco polychromy of the Uljaytu mihrab is one of the best preserved polychromy repertoires, which displays perhaps the widest colour spectrum of carved stucco polychromy and the most advanced notion of stucco colouring.⁶³⁷ The central small niche of the mihrab is coloured with dark colour combination of blue and green. The small framing inscription band comprises gilded inscription set against a dark blue background. The two Kufic inscriptions of the larger column capitals were made well visible through the use of ochre, which made them stand out from the blue and green background. The architectural lines of forms of the mihrab, of small bands, like the ones for the capitals were coloured with dark red colour. In this way, visual forms of mihrab's panel division were highlighted rather than concealed. This served for the accentuation of mihrab's vertical and horizontal axes. The central lunette with the most important historic inscription containing information about mihrab's patronage, was the focal point of the mihrab and it was gilded to be well visible. This gilded inscription was set against a blue background and possibly silver leaf covered background scrolls. To increase the contrast between this lunette and the surrounding parts of the mihrab, craftsmen employed green for the smaller Hadith inscription band framing the lunette. They achieved a colder tone of the framing inscription background by setting this inscription against a dark blue background filled with floral scrolls coloured either with ochre or covered with silver leaf. The monumental framing inscription band is a masterpiece of calligraphic design and it is gilded with silver leaf. It is set against a background of floral scroll ornamentation, which partially protrudes from the background and might have been coloured red. Silver leaf was therefore more appropriate for the inscription gilding, in order to make the inscription more visible on the red and blue background. Mihrab's spandrels with floral decoration were coloured mainly green, in order not to disturb spectators' focus on the lightest coloured parts of the mihrab – the inscriptions.

In sum, mihrab's relief was firstly made look deeper by the means of colouring of its recessed parts with dark blue. Its protruding parts were accordingly given a lighter colouristic scheme. Less significant parts of the mihrab were coloured with green and darker shades, like the floral ornamentation in the lozenges. Essential elements of epigraphic repertoire were covered with metal leaf – likely gold and silver. Use of metal leaf determined the entirely different texture of stuccos which emitted the metallic shine. In contrast, coloured surfaces displayed a more

⁶³⁶ These observations again suggest that every stucco artistic technique retained its peculiarities, in the case of the applied moulded stucco different ways of colouring, shading, were for example used.

⁶³⁷ It has been shown that the polychromy of the mihrab was manipulated through restoration interventions, when it was partially overpainted and its missing parts were integrated. It is nevertheless possible to put forward careful statements regarding craftsmen's notion of stucco colouring of this Ilkhanid stucco masterpiece.

opaque and porous texture, and they visually contrasted gilded parts of the mihrab. Further dynamic effect of the mihrab was achieved through the contrasting appearance of its darker central parts and lighter framing inscriptions. Craftsmen therefore put the biggest emphasis on the most significant inscriptions of the mihrab, which reflected its function of communicating patron's message to the faithful.

The Uljaytu mihrab therefore presents the climax of the craftsmen's notion of transforming the stucco relief into an entirely different piece of stucco revetment. Colouring highlights the message which was communicated through the mihrab and adds to the aspects of its preciousness and uniqueness as a work of art.

The Haftshuya Friday Mosque (early 14th century)

The Haftshuya Friday mosque mihrab (Cat. No. 3) retains limited amounts of original polychromy. The lower lunette of the mihrab conserves extensive traces of green. Green was applied over a layer of white, which served to render mihrab's surface suitable for colouring and which impacted the tones of colours – they appeared brighter and more opaque. In this respect, white functioned as a primer layer for polychromy application.

Ilkhanid Stucco Colouring Principles

Examination of Ilkhanid stucco polychromy repertoires and pigmentation traces allows to draw information regarding principles for stucco colouring and colour use, which constitute Ilkhanid stucco craftsmen's colouring notion.

Craftsmen tended to use diverse shades of blue almost exclusively for stucco revetment background. They employed blue for the most recessed parts, or uncarved parts of stuccos, which constituted the background for application of brighter colours. This practice has a long-standing tradition and it can be traced back to at least Nishapur stucco revetments.⁶³⁸ The reason for use of blue in the described modalities stems from the fact that it was always the darkest colour of stucco palettes. It was used consciously, in order to boost the visual appearance of depth of stucco relief. Blue was most frequently combined with the next darkest colour: green. The combination of two colours allowed for creation of darker chromatic schemes for stucco reliefs which were normally applied onto central parts of mihrabs in order to boost their plasticity. Green was most frequently employed for colouring of vegetal ornaments, especially vegetal scrolls or palmette-derived motifs. This also reveals the naturalistic approach of craftsmen, who indicated presence of vegetal elements by use of their most natural colour – green. In some cases, such as the Uljaytu mihrab, green was also employed for inscription colouring. By doing so, craftsmen created a stucco inscription band with a darker chromatic constitution, which could be juxtaposed to contrasting adjacent stucco panels of the mihrab, with lighter colour schemes. In exact contrast to blue, white, as the lightest colour of the polychromy palette, was employed for the most protruding parts of stucco reliefs. Red and white coloured protruding elements stood out from their darker background and increased the dynamic appearance of stucco reliefs. Red was also used for framing borders and architectural vertical, horizontal or curved lines of stucco revetments, in order to emphasize them and to highlight the interplay between different parts of stucco reliefs and to consequently render the appearance of stucco reliefs more dynamic. Sometimes red was used for colouring of floral

⁶³⁸ See Holakooei *et al* 2016. Blue is used in a similar way on Seljuq stucco repertoires. Similar use of colour is also noted in Andalusian stuccos of Alhambra.

decoration, without combination with white colour. This might be caused by craftsmen's will to not excessively combine colours in chromatic schemes where several colours were already employed. Ochre was used in ways similar to red and white, but it was used in smaller quantities. This might have been caused by the fact that it was less frequently available.⁶³⁹

Application of metal leaves, such as gold or silver, constituted a specific and rather exceptional approach to stucco polychromy. The practice might have been limited to more prominent endowments and commissions, due to its cost stemming from the necessary manual labour. The specific knowledge required for this separate artistic technique, which was just developed, could also have been monopolized by a small number of stucco craftsmen's workshops or external collaborators, as a secret recipe-type of knowledge. Use of gilding for stucco polychromy repertoire production could be an Ilkhanid invention. This development signals an important advancement in stucco polychromy application and consequently a leap in development of architectural revetment aesthetics.

3.3 *Ilkhanid Stuccos and their Inscriptions*

Background

This section proposes a discussion of types or inscription styles⁶⁴⁰ documented on Ilkhanid stucco revetments, and collected information regarding the content of inscriptions on Ilkhanid stucco repertoires.⁶⁴¹ Inscription style is intended as characteristics denoting the type of script and its possible peculiarities in terms of proportions, letter forms and modalities of writing.⁶⁴² Further information regarding stucco inscription styles concerns their specific production methods - the way their design is prepared, transferred on to the stucco surface and subsequently produced. Moreover, a discussion of use of inscription styles and their relationship to the content of inscriptions is provided. Patterns of occurrence and modes of use of inscription styles in the stucco revetment medium are explained.

The Ilkhanid period stuccos comprise a relatively wide spectrum of inscription styles which are either Kufic (angular scripts) or cursive (round scripts). General prevalence of cursive over Kufic styles can be considered a characteristic of Ilkhanid stuccos and other Ilkhanid architectural revetments. Two styles out of the Six Pens,⁶⁴³ *Naskh* and *Thuluth*, become more frequently employed for stucco revetments in comparison to various Kufic styles. In Seljuq period, Plain, Knotted and Floriated Kufic constituted for some of the more widespread inscription styles also in stucco medium. In Ilkhanid period, these styles gradually gave way to *Naskh* and *Thuluth*, although they were still employed in some repertoires, likely for the purpose of variegation and interplay between angular and round inscription styles.⁶⁴⁴ In other cases, choice of inscriptions styles seems to have been conditioned by regional histories of stucco revetments, as determined by mobility of Ilkhanid craftsmen's workshops.

⁶³⁹ On the other hand, it was a relatively light-sensitive pigment and its traces could have been lost at an early stage. Although it appears in many stucco repertoires, it results less frequent colour compared to red and white.

⁶⁴⁰ The term *style*, corresponds here to German term *ductus*.

⁶⁴¹ For a general overview of the major calligraphic styles, see Yaqub 1984.

⁶⁴² For an overview of history of Islamic calligraphy and diverse calligraphic styles according to regions, see Sourdel-Thomine, J., Alparslan, Ali, M. Abdullah Chaghatai and Ed., "Khat", in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. http://dx.doi.org/10.1163/1573-3912_islam_COM_0502 (Last Accessed: December 8, 2021) First print edition: ISBN: 9789004161214, 1960-2007.

⁶⁴³ For information concerning the Six pens in the Ilkhanid period, see Blair 2006, 242-260.

⁶⁴⁴ Lorenz Korn, personal communication to the author.

a.) Ilkhanid Stucco Inscription Styles – Taxonomy

Khatt-i Banna'i

The *Khatt-i Banna'i* inscription style denotes inscriptions of large dimension which are employed to cover extensive architectural surfaces.⁶⁴⁵ Its function is to cover large architectural surfaces with short repeating inscriptions which are visible from afar. Yet, these inscriptions were made with use of modest artistic techniques, and they did not obstruct the view of architectural surfaces to which other types of revetments were applied. Most commonly, *Khatt-i banna'i* inscriptions recount names of the most significant historic figures of the history of Islam, the Shahada, or short invocations to God. These inscriptions could be produced with various artistic techniques. Some of them originated in Seljuq period, but they were employed more frequently in Ilkhanid times. The *Khatt-i banna'i* inscriptions serve to render architectural surfaces uniform and to create a background for more complex decorative repertoires. Three main types of *Khatt-i banna'i* can be distinguished based on this research of Ilkhanid stucco inscriptions.

Khatt-i banna'i for exterior architectural surfaces was produced out of fired bricks and glazed tile inserts. The approach for the making of this type of revetment is similar to the described technique of Seljuq stucco plugs (see above). These inscriptions had to be planned prior to monument construction, because they constituted parts of supporting walls. As the builders proceeded with the construction of supporting walls, they filled the raising joints between outer layers of fired bricks with glazed tile inserts to form the inscriptions. Some examples of this technique from Ilkhanid period are documented in there Friday mosques of the Isfahan area,⁶⁴⁶ such as the Gar Friday mosque (Cat. No. 7) and the minaret of the Natanz complex (Cat. No. 12).

The second approach to *Khatt-i banna'i* production was developed in Seljuq period and it found continuation in Ilkhanid times. It comprised formation of *Khatt-i banna'i* inscriptions by placing the fired bricks to form raised joints which were filled with stucco plugs in forms of inscriptions. This artistic technique was more frequently used to decorate architectural interiors. A Seljuq period example is found at the Gulpayigan⁶⁴⁷ Friday mosque and an Ilkhanid one in the eastern *iwan* of the Isfahan Friday mosque.⁶⁴⁸

The third type of *Khatt-i banna'i* is typically Ilkhanid artistic technique. These inscriptions were produced with the earlier described Ilkhanid stucco plug artistic technique. The architectural surface was covered with a layer of plaster. Upon that, horizontal and vertical lines were lightly incised on to its surface in order to form a grid. The grid enabled the craftsmen to transfer the desired inscription design from a smaller scale drawing of inscription onto a larger surface to form the inscription.⁶⁴⁹ This artistic technique was frequently used during the Ilkhanid period

⁶⁴⁵ For this reason their name denotes them as *master builder's writing*.

⁶⁴⁶ See Ventrone 1977; Ventrone 1981.

⁶⁴⁷ See Korn 2012.

⁶⁴⁸ At Isfahan Friday mosque (Cat. No. 1) the revetments could have been produced in the Seljuq or in the Ilkhanid period and again it is not possible to consider it as a dating control element. For Gulpayigan Friday mosque see Korn 2020.

⁶⁴⁹ Studies of inscriptions reveal that sometimes craftsmen forgot to produce a stucco plug at the right place, due to the difficulty of design transfer.

for decoration of architectural interiors. Some examples of the technique have been documented at the Pir-i Bakran mausoleum (Cat. No. 2), where it was produced during the first out of at least three decorative interventions. Further examples include the Ushturjan Friday mosque prayer hall surfaces (Cat. No. 4) and the Haftshuya Friday mosque *qibla* wall (Cat. No. 3).

Floriated Kufic

Floriated Kufic⁶⁵⁰ is the inscription style which developed around eleventh century across the Islamic realm and it was widespread in Seljuq Iran. This style gradually disappeared in Ilkhanid period, when other inscription styles became more popular. Only a few examples of Ilkhanid Floriated Kufic have been documented, more frequently in wall painting than carved stucco medium (e.g. the second decorative phase of the Uljaytu mausoleum at Sultaniyya; Cat. No. 27). In carved stucco, Kufic was more widespread, but its elongated shafts and artificial elongations, which provide the repeating rhythm of vertical lines to inscriptions contained vegetal elements. Some examples are found in the Isfahan region. *Surat al-Fatiha* inscription at the Pri-i Bakran mausoleum, which tops the shouldered arch of the *maqbara* wall, presents a good example of this style's development.⁶⁵¹ Kufic letters in this inscription are regular, but their elongations contain flower blossom geometricized patterns topped by vegetal, leaf-like forms. These inscriptions were most commonly produced by carving of one stucco layer, to create the sharp contrast. This inscription style was most frequently employed for Qur'anic excerpts.

Plaited or Knotted Kufic

Knotted Kufic,⁶⁵² is a type of Kufic inscription style which evolves in vertical shafts with added knotted forms and it features letters with occasional knotting. It is one of the most frequently encountered inscription styles in Seljuq period. This style is also considerably widespread on Ilkhanid architectural revetments. In some cases, Knotted Seljuq Kufic continued to be employed on Ilkhanid stuccos, but new developments of the style have also been documented. One of the Ilkhanid examples of Seljuq Knotted style is illustrated on the mihrab of the Bayazid Bistami complex at Bistam (Cat. No. 19). One problematic case is the mihrab of the Farfan Friday mosque (Cat. No. 5), which contains two variations of Seljuq Knotted Kufic, but its dating remains obscure.⁶⁵³ Examples of development of Knotted Kufic style in Ilkhanid period are also encountered in the Isfahan area. The Friday mosque of Isfahan retains stucco revetments in the *shah nishin* area of the northern *iwan* (Cat. No. 1) which can be securely dated

⁶⁵⁰ See Sourdél-Thomine, J., Ory, S., Ocaña Jiménez, M., Golvin, L., Bivar, A.D.H., Freeman-Greenville, G.S.P., Dijkema, F.Th., Alparslan, A., Damais, L. Ch. and Burton-Page, J., "Kitābāt", in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Consulted online on 08 December 2021 http://dx.doi.org/10.1163/1573-3912_islam_COM_0525 First published online: 2012 First print edition: ISBN: 9789004161214, 1960-2007.

⁶⁵¹ Related inscription framed the monumental lunette of the Haftshuya Friday mosque mihrab (Cat. No. 3).

⁶⁵² See Sourdél-Thomine, J., Ory, S., Ocaña Jiménez, M., Golvin, L., Bivar, A.D.H., Freeman-Greenville, G.S.P., Dijkema, F.Th., Alparslan, A., Damais, L. Ch. and Burton-Page, J., "Kitābāt", in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Consulted online on 08 December 2021 http://dx.doi.org/10.1163/1573-3912_islam_COM_0525 First published online: 2012 First print edition: ISBN: 9789004161214, 1960-2007.

⁶⁵³ It is not clear if this portion of the mihrab (the entire mihrab is undated) dated back to the Seljuq period, or if it was produced in the Ilkhanid period. Given the infrequency of use of this script in the Ilkhanid period in the Isfahan area it results more likely that this part of the mihrab was work of Seljuq stucco craftsmen.

to the Ilkhanid period. There, the inscription recounts a Qur'anic excerpt (*Surat al-Nur*) in Knotted Kufic style. The artistic technique employed to produce the inscription comprises carving of one or more stucco layers. This style was most frequently employed for monumental dimension inscriptions on walls and in mihrabs, which recount Qur'anic excerpts.

Isolated Square Kufic Bands

Individual bands of Square Kufic⁶⁵⁴ inscriptions were frequently employed in Ilkhanid stuccos. But this inscription style was not an Ilkhanid invention. The specific characteristic of these inscriptions comprises shifting of orientation of letters in all four cardinal sides, which also comprises mirroring of letters.⁶⁵⁵ This style of Square Kufic was produced with specific procedures. Craftsmen first incised square grids with vertical and horizontal incisions on stucco surface (similar to those for *Khatt-i Banna'i* but smaller in size) which were used to transfer Square Kufic inscriptions from smaller drawings, also divided into grid patterns.⁶⁵⁶ Upon the incision of the grid on the stucco surface, craftsmen outlined the inscription in square fields with use of red colour. Subsequently, they carved out parts of the stucco layer which did not constitute the inscription.⁶⁵⁷ Numerous examples of this style, especially those from the third decorative phase of the Pir-i Bakran mausoleum (1312-13; Cat. No. 2) and the Haftshuya Friday mosque mihrab (Cat. No. 3) show the use of the grid and the red colour for the outlining and design transfer for this inscription style.⁶⁵⁸ The style was exclusively employed for Qur'anic excerpts and it was particularly widespread in the Isfahan region. Further examples from the Ilkhanid period are found at the Friday mosque of Ushturjan (Cat. No. 4) and the Ilkhanid mihrab at the Sava Friday mosque (Cat. No. 34).

Square Kufic Bands Combined with Other Inscriptions

The described style of Square Kufic inscriptions could be combined with other inscription bands in two separate registers. The earliest dated case of this occurrence is believed to be the Square Kufic inscription at the Pir-i Bakran mausoleum (Cat. No. 2) which runs parallel to the *Surat al-Insan* inscription produced in *Naskh* style and located above it. These two inscriptions run on the top of the tile dado area of mausoleum's *iwān*. In this case, the inscription recounts a Qur'anic verse. It was produced in the third decorative intervention dated 1312-13. This is an infrequent occurrence and few parallels can be proposed for the use of this style. The decision to combine the two styles might be a combination, which was a single practice of a craftsman, who decided to try to render the inscription band appear more complex and monumental.

⁶⁵⁴ See Sourdel-Thomine, J., Alparslan, Ali, M. Abdullah Chaghatai and Ed., "Khatt", in: Encyclopaedia of Islam, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Consulted online on 08 December 2021 http://dx.doi.org/10.1163/1573-3912_islam_COM_0502 First published online: 2012 First print edition: ISBN: 9789004161214, 1960-2007.

⁶⁵⁵ This renders the script difficult to read for untrained reader.

⁶⁵⁶ For the description of the entire procedure, see Aslani 2014, 85-86.

⁶⁵⁷ It remains unclear whether red colour used for the outlining of the inscription design also became to designate the final colour of the inscriptions, or if this colour was subsequently covered with other colours.

⁶⁵⁸ See, for example, Holakoei 2007.

Square Kufic Bands in Stucco Composition

Already Seljuq and especially Ilkhanid stuccos contain bands of Square Kufic inscriptions which functioned as iconographic elements of more complex stucco compositions. These bands consisted of repeating contents produced in Square Kufic style and they often assumed reduced dimensions. Inscription bands contain either repeating names of revered figures from the history of Islam, or names of God, invocations to God and occasionally Qur'anic excerpts. These bands are typically arranged into diverse geometric forms, such as tripartite undulating leaf-like forms. These bands are parts of more complex stucco revetments. The earliest case of use of this type of inscription band is recorded in the Friday mosque of Qazvin,⁶⁵⁹ where it constitutes the background element to the stucco repertoire on prayer hall's supporting walls. In Ilkhanid period, such bands became more closely integrated with epigraphic and decorative elements of stucco revetments. Their use was widespread in the Isfahan area where they are found above all in mihrab panels: at the Ushturjan Friday mosque (Cat. No. 4), the Farfan Friday mosque mihrab (Cat. No. 5) and the lunette of the Pir-i Bakran mausoleum mihrab (Cat. No. 2). But further examples are also found in other geographical areas, as indicated by the mihrabs of the Varamin Friday mosque (Cat. No. 28) and the Tabriz Friday mosque (Cat. No. 22). Rather than being the primary focus of the stucco repertoire, the inscription bands enriched complex stucco compositions, as another form of an epigraphic element, which through its repetition of content could have assumed an apotropaic function.

Carved Stucco Square Kufic Panels

Carved stucco panels with Square Kufic inscriptions occur only in two Ilkhanid monuments, which are both located in the Isfahan area: the Pir-i Bakran mausoleum (Cat. No. 2) and the Haftshuya Friday mosque (Cat. No. 3).⁶⁶⁰ Archaeometric research of these panels by Holakooei provides preliminary information regarding the artistic techniques for their production.⁶⁶¹

Craftsmen first covered architectural surfaces with a very thick layer of stucco. They subsequently indicated grid lines on the panels or on their edges. These gridlines served for the inscription design transfer from the sketch onto the large stucco surface. The inscription design was transferred on the stucco surface with red colour. Subsequently, craftsmen carved out parts of the stucco surface, which constituted its background. It remains unclear whether the red colour employed to outline the design for carving, became to constitute their colour upon carving, or if panels were subsequently covered with other colours. The described inscription style and the artistic technique are regionally limited, because they required a specific production knowledge and it was perhaps a knowledge specific to one stucco craftsmen's workshop. Specific characteristic of these inscriptions comprises the composition into which the words or parts of the inscriptions are arranged. Inscriptions begin in the lower right-hand side angles of panels and they continue in the clock wise direction from the exterior towards the interior of panels. Each inscription is a unique composition. Similar to the Square Kufic

⁶⁵⁹ Pope and Ackermann 1977[1938-39], Vol. 3, 990-994; <https://archnet.org/sites/1651> (Last Accessed: June 7, 2021).

⁶⁶⁰ See Oman 1999.

⁶⁶¹ Summary from Holakooei 2007 and personal communication to the author by Parviz Holakooei. See also Aslani 2014, 83-86.

inscriptions, in these inscriptions, letters are also arranged in all four cardinal directions, with frequent letter mirroring; occasionally, entire words are mirrored. The described inscription design required extensive planning, especially for large panels with long inscriptions. The content of the inscriptions was frequently explicitly Shi'ite: the extant panels in the two monuments recount the blessings to the Fourteen Infallibles, names of God and short prayers.

Six Pens in Ilkhanid Carved Stuccos

Ilkhanid stucco revetments witnessed a proliferation in use of various Square Kufic style inscriptions, a specific development of its time. The second major development in use of calligraphy for Islamic stucco revetments is the sudden profusion of cursive styles for Ilkhanid stucco inscriptions.⁶⁶² The two calligraphic styles, *Naskh* and *Thuluth*, out of the total of six cardinal cursive styles (the Six Pens) were more frequently employed in stucco medium (compared to earlier periods). They were used for monumental inscriptions. This development had a long-standing impact beyond the fall of the Ilkhanid Empire. In Muzaffarid and Timurid architectural revetments, mainly in tile mosaic medium, an unprecedented scale in use of *Thuluth* and *Naskh* styles occurred, which saw further developments under the Safavids, above all in tile mosaic. The significance of use of these inscription styles in Ilkhanid stucco medium is the turning point of this long-term development, which strongly impacted future calligraphic trends in architectural revetment design and aesthetics.

Naskh

The *Naskh*⁶⁶³ style is the most commonly used inscription style on Ilkhanid stucco revetments. *Naskh* was often employed already by Seljuq stucco craftsmen, but in Ilkhanid period it became the most prominent and frequently employed inscription style. The popularity of use of this style in Ilkhanid period on both, tile and stucco revetments, is most likely linked to the fact that it is easy to read and easier to produce, compared to the other styles.⁶⁶⁴ *Naskh* was easy-to-learn style with effective aesthetic and thus desired by craftsmen. In Ilkhanid tile medium, the style often contains diacritic marks and vocalizations, but in stucco, these devices are used less frequently.⁶⁶⁵ Similar to *Thuluth* in Ilkhanid stucco, *Naskh* was used for Qur'anic excerpts, Hadith or historic inscriptions. Based on high frequency of use of *Naskh*, it seems that it was a common skill of stucco craftsmen to be able to write in this calligraphic style.

Production of *Naskh* required a different approach, compared to Kufic or Square Kufic. While Kufic was designed with the aid of baselines and Square Kufic and *Khatt-i banna'i* with gridlines for transfer of their designs from smaller sketches, *Naskh* was first sketched out on the stucco surface and then incised free-hand with metal tools. This was determined by its visual characteristics and forms of letters of this cursive, rather than angular script, with similar

⁶⁶² For a discussion of Six pens in the Ilkhanid period, see Blair 2006, 242-260.

⁶⁶³ See Burton, J., "Naskh", in: Encyclopaedia of Islam, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Consulted online on 08 December 2021 http://dx.doi.org/10.1163/1573-3912_islam_SIM_5832 First print edition: ISBN: 9789004161214, 1960-2007

⁶⁶⁴ The reform of the Arabic script by Ibn Muqla proposed detailed parameters of proportion for cursive script letters and writing.

⁶⁶⁵ This might be caused by the nature of the medium and the need for more precise work in the stucco medium to produce them. On the other hand stucco craftsmen might felt that diacritical marks and especially vocalizations are simply not necessary, because the script is easy to read.

phenomenon observed for *Thuluth*. These styles required for their design outlines to be applied free-hand. *Naskh* required for the inscriptions to be outlined with paint and more commonly with direct incisions on stucco surface prior to carving. Inscriptions in *Naskh* style could be produced with one stucco layer carving technique or with more complex techniques which required carving of two or more fine layers of stucco.

Naskh stucco inscriptions are normally employed in two types of stucco revetments: for framing bands and for stucco panels which were parts of more extensive compositions. Such inscription bands run along architectural lines to enhance them. Historic inscriptions in *Naskh* are found on entrance portals, lunettes and framing bands of Ilkhanid stucco repertoires. *Naskh* inscriptions with Qur'anic excerpts could run along dado areas and emphasize horizontal architectural lines of dados. Inscription bands in *Naskh* can also constitute panels of mihrabs, where *Naskh* is combined into compositions, which contain other calligraphic styles such as different forms of Kufic or *Thuluth*. Compared to *Thuluth* or *Muhaqqaq*, *Naskh* was less monumental and usually contained epigraphic content of lesser significance in comparison to these inscription styles.

Thuluth and Muhaqqaq

*Thuluth*⁶⁶⁶ inscription style was frequently employed for Ilkhanid stucco inscriptions. Specific aesthetic features rendered the style the most suitable for monumental inscription bands, which were either placed independently or constituted parts of mihrab designs. *Thuluth* and *Muhaqqaq* are two separate inscription styles in manuscript calligraphy, the medium in which they developed.⁶⁶⁷ *Thuluth* is characterised by the specific proportion of 1:3, between the horizontal lengths of letters and the length of their *hastae*. In comparison to *Muhaqqaq*, *Thuluth* is easier to read, because its letters resemble *Naskh*, the common round script style the literate audience was acquainted with. Paper medium allowed for the development of these styles, but their translation into carved stucco medium and the fact that the inscriptions were often designed by stucco craftsmen, determined a more blurred distinction between the inscription styles in carved stuccos, often between *Naskh* and *Thuluth*.⁶⁶⁸ The most reliable elements for the distinction of two styles are some forms of letters which are of distinct forms in two styles.⁶⁶⁹

Thuluth and *Muhaqqaq* share aesthetic traits, but *Thuluth* was employed more frequently for inscriptions of Ilkhanid stuccos and *Muhaqqaq* was employed only occasionally. The round form was one aesthetic characteristic which rendered their text appear very fluid and effective in juxtaposition to horizontal and vertical lines of stucco revetments or angular inscriptions on stuccos. These two styles have their vertical axes accentuated via the proportions and they are thus more monumental, compared to *Naskh*. Vertical letter shafts gave a fluid rhythm to inscriptions and could be further elongated, if necessary, to achieve a more monumental

⁶⁶⁶ See Sourdel-Thomine, J., Alparslan, Ali, M. Abdullah Chaghatai and Ed., “*Khatt*”, in: *Encyclopaedia of Islam*, Second Edition, Edited by: P. Bearman, Th. Bianquis, C.E. Bosworth, E. van Donzel, W.P. Heinrichs. Consulted online on 08 December 2021 http://dx.doi.org/10.1163/1573-3912_islam_COM_0502 First print edition: ISBN: 9789004161214, 1960-2007.

⁶⁶⁷ For discussion of *Thuluth* and *Muhaqqaq*, see Blair 2006, 242-260.

⁶⁶⁸ This is reflected in some cases where scholars of stucco revetment also find it difficult to define exact styles of inscriptions executed in the stucco medium.

⁶⁶⁹ For example the forms of *tha marbuta*, differences between *sin* and *shin*, etc.

appearance. These vertical shafts were combined with concave surfaces, which rendered inscriptions more dynamic in their appearance. In sum, stucco craftsmen exploited aesthetic properties of these styles, which originally developed in book art, and were translated into the stucco medium.

Similar to *Naskh*, *Thuluth* inscriptions were frequently combined into more complex stucco revetment designs through the interplay between inscriptions and floral scroll backgrounds. Like *Naskh*, these inscription compositions could be produced by carving of one or more layers of stucco. *Thuluth* was employed for the most significant inscriptions of stucco revetment repertoires, to make them appear monumental and yet easy to read by the literate audience. Occasionally, the *Thuluth* was combined with another inscription of angular form, and less significant content which filled the background. The inscription content recounted in the *Thuluth* was historic, followed by Hadiths and Qur'anic excerpts.

Some examples of use of *Thuluth* have been documented at the Pir-i Bakran mausoleum (the monumental lunette in the burial chamber dated 1303-04 and the mihrab; Cat. No. 2), the Uljaytu mihrab (the historic inscription and the Hadith framing band; Cat. No. 1)⁶⁷⁰ the mihrab of the Marand Friday mosque (the monumental framing inscription band; Cat. No. 22) and the Friday mosque of Varamin (the monumental inscription band in the domed prayer hall; Cat. No. 28).

Combinations of Inscriptions in One Inscription Band

The specific practice of combining inscriptions in diverse styles into one inscription band is one of the peculiarities encountered in Ilkhanid stucco revetments. It allowed the craftsmen to produce complex designs for stucco revetments which epitomized their skills of design combination, production and variation. Such inscription designs are most frequently encountered in epigraphic framing bands of mihrabs or supporting wall surfaces. The most significant examples, displaying the level of creativity of these designs are found at the Abarquh Friday mosque mihrab (Cat. No. 10), the Pir-i Bakran mausoleum mihrab (Cat. No. 2) and the Varamin Friday mosque mihrab (Cat. No. 28). This design practice was especially frequent in applied moulded and stencilled stucco medium, where inscriptions were also mirrored and written in different directions. The best examples are found on the mihrab framing band of the Rukniyya complex (Cat. No. 29) and the second decorative phase of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27).

Conclusion

The discussion illustrates the characteristics and practices of the use of inscription styles for stucco revetments. It has been shown that the selection of styles changed from the Seljuq to the Ilkhanid period. Knotted and Floriated Kufic styles were employed less frequently and gave way to more frequent use of cursive styles. Kufic style continued to be in use and it was given a new function in stucco panels with combined inscriptions as background fillers. Square Kufic

⁶⁷⁰ The Uljaytu mihrab displays masterly use of *Thuluth*, characterised by the elongations of letter vertical shafts, which assume curved form on the concave surface of the framing band stucco panel. This artistic mechanism adds to the elaborate appearance of the framing Hadith inscription of the mihrab.

became more widespread and new artistic techniques with different types of Square Kufic, such as monumental panels or inscription bands emerged. The other significant development comprises a greater frequency of use of cursive styles, two out of Six Pens: *Naskh* and *Thuluth*, and occasionally *Muhaqqaq*.

Accordingly with the listed developments, stucco revetment designs with epigraphic content became more complex and displayed a greater variety of inscription styles. These trends saw their continuation in the tile mosaic and ceramic media in the post-Ilkhanid period. Several inscription styles required knowledge of specific artistic techniques for the transfer and production of their design in stucco medium. Some regional differences in stucco inscription style traits can be spotted, although some of these practices occurred over more extensive geographical areas. The Ilkhanid craftsmen were creative in designing and producing epigraphic elements of stucco revetments and their experimentation led towards the development of new stucco revetment aesthetics distinct from the Seljuq legacy of stucco production. Related achievements are discernible in other Ilkhanid architectural revetment media.

b.) Ilkhanid Stucco Inscriptions Content

Fig. 34.

This section proposes information regarding the epigraphic content of Ilkhanid stuccos and it is based on the quantitative documentation of frequency of occurrence of inscription content in Ilkhanid carved stucco programmes. Understanding of the epigraphic programme content is essential for the discussion of the meaning and function of stuccos. Inscriptions were the main elements through which the patron's message was communicated to the audience. Moreover, the patron determined the function and the goal of the stucco repertoires and this was expressed in the most explicit way through the content of epigraphic programmes. The patron's idea was however translated into the stucco medium by the craftsmen who produced inscriptions. The relationship between inscription content, their location, and specific inscription styles must therefore be observed. The balance between stucco inscription styles, types of stucco revetments and their location in the architectural spaces determined the specific message of the epigraphic repertoires, which determined the meaning and function of the stuccos.

Background

Inscriptions on Ilkhanid stuccos can be divided into two groups, based on their content: historic inscriptions and religious inscriptions.

Historic inscriptions⁶⁷¹ provide information regarding the monument's function, function of a specific architectural space or element, the type of the intervention during which the stuccos were produced (construction, decoration, re-decoration/renovation/repairs), the patron of the intervention, the revered figures connected to the monument and the date of completion of constructive or decorative interventions.⁶⁷² They are frequently located visibly in architectural

⁶⁷¹ See Gaube 1982, 213-215.

⁶⁷² Gaube 1982, 213.

contexts and they were written with inscription styles easy to read (most frequently *Naskh*), reflecting the significance of the sponsorship of a constructive or decorative undertaking.⁶⁷³

Religious inscriptions in stucco can be further subdivided according to their source: Qur'anic excerpts, Hadiths, invocations to God, and Blessings to and names of revered figures of the Islamic religion. These inscriptions were placed on the most sacred parts of the architectural interiors and they frequently impacted the sanctity of the architectural spaces. They are concentrated in the *qibla* areas, *qibla iwans*, entrance portals or in burial spaces. Some occur more frequently, and others are employed for specific purposes. Scrutiny of these inscriptions, their content, position, and occurrence, should thus provide more detailed information for the understanding of their relationship to the socio-political context of monument patronage and stucco revetment repertoires.

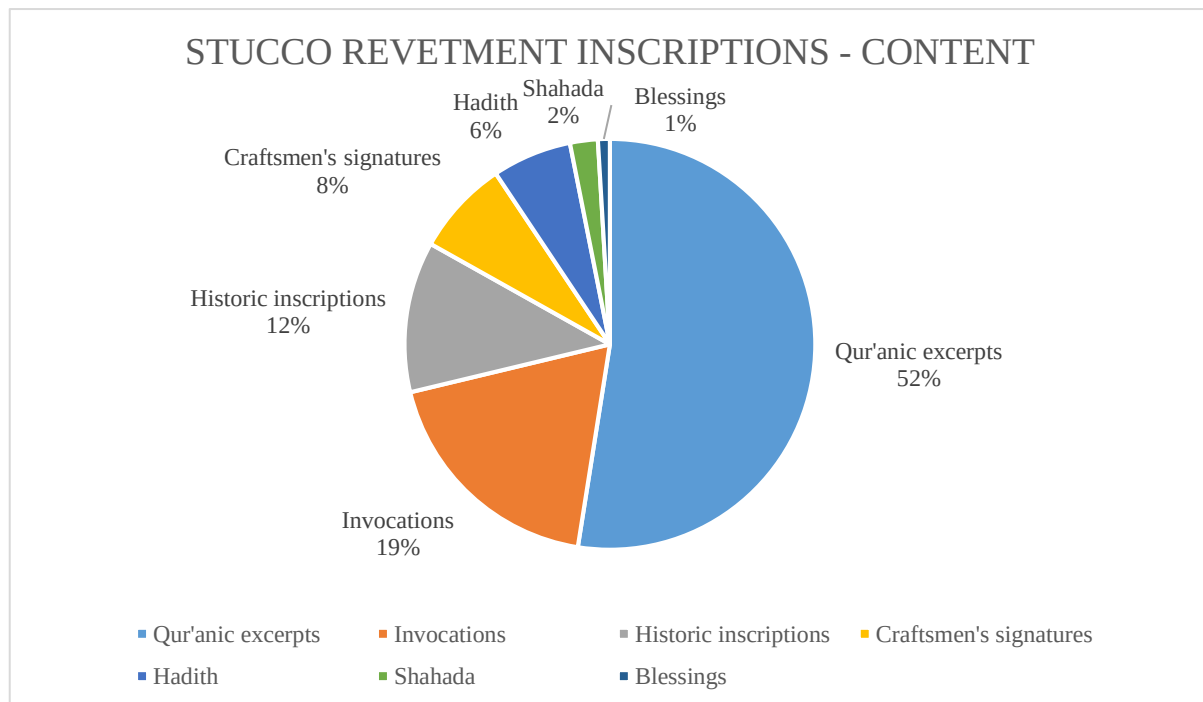


Figure 34: Quantitative information concerning the frequency of occurrence of inscription content on carved Ilkhanid stucco repertoires presented in this study.

Statistics of Inscription Content Occurrence

This research was able to document some 320 inscriptions in carved stucco medium, in 43 monuments. Most inscriptions are written in Arabic (98,75%), except for 1,25% which are written in Persian. The largest part of the inscriptions are Qur'anic (168 cases; 52,5%), followed by religious invocations (60 cases; 18,75 %) and historic inscriptions (37 cases; 11,56%). Some 7,5 % (24 cases) of inscriptions comprise signatures of craftsmen. Only a small portion of the inscriptions consists of Hadiths (20 cases; 6,25 %), Shahadas (7 cases; 2,2 %) and Blessings (3 cases; 0,9 %). Further research and future readings of inscriptions will allow the refinement of

⁶⁷³ This is significant, given that the majority of structures are religious, and one might assume that the primary message of such decorative repertoires would be religious in content.

the presented data. Another line of inquiry should comprise the measuring of the inscription lengths to understand the proportion of architectural surfaces they cover.⁶⁷⁴

Historic Inscriptions

Similar to the Seljuq, the Ilkhanid carved stucco inscriptions were above all written in Arabic. Only occasionally were some inscriptions written in Persian, such as the *Shahnama* content or poetry excerpts.⁶⁷⁵ Persian additions to Arabic inscriptions are occasionally contained in the craftsmen's signatures where they are limited to the use of verbs, appellatives for professions, and names, rather than entire texts written in Persian (see the Appendices Nos. 4 and 5 of Chapter 4). Use of Persian could be determined by the craftsmen's will to render these inscriptions more comprehensive to the faithful.⁶⁷⁶ A similar phenomenon is sometimes spotted in the use of diacritical marks; inscriptions do not contain them, except for craftsmen's signatures.⁶⁷⁷ Later historic inscriptions in the Iranian territory, starting in the Timurid period were more frequently written in Persian. The number of documented historic inscriptions in carved stucco is relatively small, compared to the extensive dimensions of epigraphic programmes, which mainly consist of religious inscriptions.

Historic inscriptions⁶⁷⁸ most frequently begin by naming the sultan during whose reign the patronage of a monument took place. They continue by offering information on the patron who ordered a certain intervention. The intervention type is specified by the use of specific verbs and occasionally by directly naming the types of interventions. Inscriptions contain detailed lists of appellatives⁶⁷⁹ pertaining to patrons and they frequently designate the types of monuments and their function. Some inscriptions specifically highlight who was financially responsible for the endowment and who oversaw the constructive or decorative intervention. For funerary structures, inscriptions often specify the identity of revered personages buried in them. Inscriptions conclude with blessings to patrons, information concerning the time of conclusion of interventions and craftsmen's signatures. The described structuring of historic inscriptions was inherited from the Seljuq period.

The content of historic inscriptions is therefore political and closely tied to the act of the sponsorship of interventions. It is highly probable, although impossible to prove, that historic inscriptions were desired by the patrons. It is however not clear who was in charge of composing these texts. A learned scribe or an Ilkhanid official could be asked to compose the text, although these texts are rarely elaborate or innovative. They however rarely reveal grammatical mistakes,

⁶⁷⁴ This is beyond the feasibility of this research.

⁶⁷⁵ A good example is provided by the epigraphic programme, consisting of the *Shahnama* excerpts, at the Imamzada Khizr mausoleum in Hamadan (Cat. No. 37). Persian content occurs more frequently in lustre tile medium, for example, on the tiles from the Imamzada Yahya in Varamin (Cat. No. 36) and the Pir Husayn Khanqah in Azerbaijan (Cat. No. 25).

⁶⁷⁶ Viola Allegranzi, paper presented at the Annual Colloquium of the Ernst Herzfeld Society, *The History of Material Cultures and Visual Arts in Islamic Lands: Current State of Research and New Perspectives*, University of Strasbourg, July 5-7, 2018.

⁶⁷⁷ This is for example the case with the signature of Muhammad Shah al-Naqqash at Pir-i Bakran (Cat. No. 2).

⁶⁷⁸ For discussion of structure of historic inscriptions see Gaube 1982, 213-215.

⁶⁷⁹ Appellatives for patrons, as already stated by Miles, are not as standardized as they were in the Seljuq period. Often honorary titles pertaining to high-ranking figures in the Empire may have been used for patrons with less important political roles and social status in the Ilkhanid Empire.

and thus imply that a learned person wrote them. These inscriptions are most frequently written in *Naskh* or *Thuluth* which rendered them of monumental appearance and easy to read. Historic inscriptions assumed important positions in the context of architectural spaces and effort was put into making them visible and readable through their form and polychrome appearance. These inscriptions therefore constitute the primary message of numerous repertoires, which communicate factual information regarding the monument, its patron, function and meaning. This information highlights the prominence of patrons through the prestige of the interventions as determined by the sacred locus. Religious inscriptions communicate the secondary message of the intervention which was that of highlighting the religious function and meaning of the architectural structures.

Religious Inscriptions

Religious inscriptions reflect the function of the monument and of its architectural spaces and surfaces. Their quantitative analysis reveals that a general selection of Qur'anic verses was employed for stucco revetment repertoires and only occasionally, specific and less common excerpts were used (see below). Invocations to God on stuccos also stem from a standardized repertoire of a restricted number of invocations. It remains unclear to what level the inscription repertoire was dictated by patrons. It is likely that most choices, except for some exceptional imperial commissions, depended more on the craftsmen's workshops. The most peculiar inscriptions, which also indicate the socio-political context of their production, are the Hadith inscriptions and inscriptions indicating whether monuments were of the Sunnite or Shi'ite religion. The Shahada is a partially reliable indicator of the religious affiliations of the monuments, which could change through time and could be expressed in subsequent redecoration interventions. Other indicators of distinction of the Shi'ite faith were the Blessings to the Ahl al-Bayt, or the Fourteen Infallibles, which are clearly Shi'ite in content. Some Hadiths also highlight the authority of Islamic religious figures tied to Shi'ite Islam. It is difficult to comprehend the religious affiliation of a monument through its epigraphic programme in some cases and in others the divide between the two faiths is blurred. This has so far been explained as Ilkhanid religious eclecticism and as connected to the Sufi traits of the monuments.⁶⁸⁰ But the research presented in this work documents several epigraphic repertoires and their redecorations which illustrate the explicit message of one of the two religions contents. Observations of most frequently occurring Qur'anic excerpt choices also allow propositions regarding the most commonly used Qur'anic excerpts and based on their content, the most significant parts of Qur'an as topics of religious doctrines.

Invocations

Invocations to God are specific types of religious texts which express statements about Islam or invocations praising God.⁶⁸¹ Some of the most common statements are: *There is no god but God, The Dominion belongs to God, Praise be to God, But Allah will spare you their evil*, etc. There do not seem to be differences in use of these invocations between the Sunni and the Shi'ite branches of Islam. In addition to the stucco medium, these invocations are also found in

⁶⁸⁰ Blair 1978, 60.

⁶⁸¹ For a list of invocations to God, see Gaube 1982, 222.

other architectural revetment media. Use of these invocations followed specific principles for choice of their visual form and for their positioning within stucco repertoires. Two frequent uses of invocations are discerned. The first type represents invocation cartouches, and the second type comprises inscription bands with repeating invocations to God. Some invocations occasionally constitute independent epigraphic elements of compositions in carved stucco, wall painting, applied moulded and stencilled stuccos and lustre tile media.

The first type of invocations consists of cases where invocations are made in form of short inscription bands which resemble cartouches; they are isolated from other inscriptions and placed into rectangular frames, which enhance their visibility. Such cartouches were placed in stucco repertoires, normally in pairs in order to enhance symmetry of the stucco revetments. They were also placed next to religious content inscriptions, to boost their significance and meaning. This modality of the use of invocations is especially frequent in stucco mihrabs. Invocations are combined into pairs of cartouches which either comprise two different invocations of similar length or they repeat the same invocation. These cartouches are normally placed on capitals of mihrab columns, or immediately below them. They are often associated with the Shahada and placed in its proximity to emphasize its meaning. Different styles ranging from Kufic, to Square Kufic or *Naskh* were used for such cartouches. The modality of their use might reflect their apotropaic function.

The second manner of invocation use consists of arrangement of invocations into repeating inscription bands. Most commonly, these inscription bands make use of Kufic and especially Square Kufic inscription styles. These bands are subsequently incorporated into stucco revetment repertoires of mihrabs or panels covering supporting walls in two manners. Inscriptions can either comprise framing bands of revetment panels or they function as one of the decorative elements of the designs.⁶⁸² These bands act as a content background of epigraphic programmes. They likely retained apotropaic functions.

It has been shown that invocations do not only express religious messages, but that they were also employed as iconographic elements for stucco repertoires, which signalled the presence of God and the religion. These invocations derive from a long-standing tradition also reflected in Seljuq stuccos and other types of architectural revetment repertoires beyond the Iranian territory. Invocations were also employed for the decoration of Islamic art objects.

Qur'anic Excerpts

This section presents the results of the quantitative examination of the frequency of occurrence of Qur'anic excerpts in carved stucco medium. It is based on the examined epigraphic programmes in carved stucco medium presented in the Catalogue of Monuments, the appendix to this chapter (Appendix No. 2). The section proposes examples of the most frequently and least frequently employed Qur'anic excerpts for carved stuccos. It aims to shed light on factors

⁶⁸² One such case, frequently occurring in the Isfahan area, are the Square Kufic bands with invocations (see above), which are arranged in three-lobed forms and came to designate an epigraphic ornamental element of mihrab panels or lunettes.

determining selection, frequency in use, and modalities of employment of Qur'anic verses and chapters.

Quantitative research was able to discern the most frequently employed Qur'anic excerpts of inscriptions in carved stucco repertoires.⁶⁸³ They derive from the following chapters: *Surat al-Baqara* (16 cases), *Surat al-Fath*, (16 cases), *Surah Al-Imran* (11 cases), *Surat al-Isra* (12 cases), *Surat al-Ikhlās* (12 cases), *Surat al-Fatiha* (9 cases), *Surat al-Tawba* (8 cases), *Surat al-Mu'minun* (6 cases), *Surah Ya-sin* (6 cases), *Surah Hud* (5 cases), *Surat al-Hashr* (5 cases) and *Surat al-Jum'a* (6 cases).

Moreover, monuments where stuccos were produced by the same craftsmen indicate that the craftsmen employed a repetitive selection of excerpts (the case of the Damghani craftsmen, see Cat. Nos. 18-19). Some excerpts from chapters occur only once and they might reflect specific choices of the craftsmen who composed the epigraphic repertoires. These less frequently occurring excerpts are mainly featured in more extensive epigraphic repertoires. They might have been selected in order for the inscriptions not to repeat.

The following excerpts from chapters have been documented only once: *Surat al-Nisa* (verse 59; the Uljaytu mihrab), *Surat al-Ma'ida* (verses 54-61; the Gudzar Imamzada; Seljuq or Ilkhanid?), *Surat al-An'am* (verses 95-96; the Kashan Friday mosque; Seljuq?), *Surat al-Nakhl* (verse 128; the Jawin Friday mosque), *Surah Maryam* (verses 11-13; the Farumad Friday mosque), *Surah Taha* (verse 33, the Farumad Friday mosque), *Surat al-Ahzab* (verse 56; the Ushturjan Friday mosque), *Surat al-Nur* (verse 36-38; the *shah nishin* of the northern *iwan* of Isfahan Friday mosque), *Surat al-Ghafir* (verse 16; the Alinja Khanqah), *Surat al-Najm* (verses 12-16; the Sujas Friday mosque mihrab), *Surat al-Rahman* (partially legible; the Gunbad-i Sabz), *Surat al-Saff* (verse 13; the Pir-i Bakran mausoleum), *Surat al-Qalam* (verse 51-52; the Haftshuya Friday mosque), *Surat al-Naba* (verses 1-17; the Turbat-i Jam complex), *Surat al-A'la* (verses 1-15; the Farumad Friday mosque), *Surat al-Dhuha* (verses 1-11; the Farumad Friday mosque), *Surat al-Ma'un* (verses 1-7; the Varamin Friday mosque).

Some excerpts from these chapters were however documented in other Ilkhanid architectural revetment media.

The Most Frequently Occurring Qur'anic Chapters

Surat al-Baqara and Ayat al-Kursi

Ayat al-Kursi, the Throne verse, is verse 255 of the second Qur'anic chapter, *Surat al-Baqara*. This verse is one of the most frequently employed Qur'anic excerpts on objects of art and architectural revetments of the entire Islamic realm.⁶⁸⁴ The verse expresses the unquestionable suzerainty of God over all living things, the skies and the Earth, and it presents one of the core principles of the Islamic religion. The verse was frequently employed for short inscriptions on isolated stucco panels and framing inscription bands of mihrabs. The most common location for the verse is the Ilkhanid stucco mihrabs, where it was often combined with adjacent verses of *Surat al-Baqara* (verses 254 and 256). The *Ayat al-Kursi* is often given a prominent position

⁶⁸³ Compare to Dodd and Khairallah 1981, Vol 1, 61-70.

⁶⁸⁴ Compare to *Ibid.*, Vol 2, 9-18.

within epigraphic repertoires, and it is written in Kufic, *Naskh* or *Thuluth*. The verse is featured in a variety of sizes, and it is occasionally reproduced as the main framing inscription bands of mihrabs, as in the case of the Haftshuya Friday mosque (Cat. No. 3). The verse might have been associated with the theme of patronage or earthly suzerainty of rulers and their officials, who alluded to their power via the sponsorship of stucco revetments for religious buildings.

Further verses from Surat al-Baqara in the Ilkhanid stuccos comprise verses 21-22, 125-126, 136, 238, 258-259.⁶⁸⁵ These verse selections do not repeat across stucco repertoires and might reflect specific choices of inscription content.

Surat al-Fath

This significant and frequently featured Qur'anic chapter in Ilkhanid stuccos concerns the theme of the victory of Islam over unbelief. Selected verses for Ilkhanid stuccos comprise verses 1 to 6.⁶⁸⁶ The explicit tone of the chapter also comprises threats of what happens to the disbelievers and positive examples of rewards for true believers. But the most important is the theme of the ultimate triumph of the Islamic religion. Selected verses of the chapter in Ilkhanid stuccos are the first six verses, rather than its other parts, which concern the theme of the power of God and punishment for disbelievers. These verses are frequently employed for stucco mihrabs, but independent monumental inscriptions contain parts of this chapter and they might reflect the significance of its content. Some examples of the selected verses of the chapter in stucco medium comprise the mihrabs of the Ushturjan Friday mosque (Cat. No. 4), the Pir-i Bakran mausoleum (Cat. No. 2) and the Sava Friday mosque Ilkhanid mihrab (Cat. No. 34).

Surah Al- 'Imran

The *Surah Al- 'Imran* emphasizes the crucial position of the Prophet in the Islamic religion, God's suzerainty and attributes, and especially God's and the Prophet's oneness. This chapter is one of the more pointed texts, which illustrates punishments for disbelievers and highlights advantages and rewards granted to pious Muslims. The nature of the text composition is comparable to the *Surat al-Insan* and to *Surat al-Qalam*. But for the Ilkhanid stuccos, only specific verses from the chapter are employed: 16-19, 26-28; they concern the theme of oneness of God, his attributes and significance.⁶⁸⁷ These verses are mainly employed for inscription bands, isolated stucco panels and mihrabs. The chapter is mostly translated into stucco medium with the Kufic or *Naskh* inscription styles. Some examples of these inscriptions comprise the mihrab of the Kirmani mosque at Turbat-i Jam (Cat. No. 30) and the Haftshuya Friday mosque mihrab (Cat. No. 3).

Surat al-Isra'

Surat al-Isra', the chapter of the night journey, treats the topic of the Prophet's night journey to the sky, where he encountered God and received the commandments for regulating the behaviour of pious Muslims. Selections of verses from this chapter, verse: 77-81, are featured

⁶⁸⁵ Compare to Dodd and Khairallah 1981, Vol. 2, 4-21.

⁶⁸⁶ Compare to *Ibid.*, 118-121.

⁶⁸⁷ Compare to *Ibid.*, 22-35.

frequently in Ilkhanid mihrabs.⁶⁸⁸ Their message concerns the significance of prayer performance. Some comprise the mihrabs of Jawin Friday mosque (Cat. No. 20), the mihrab of the Baba Afzal mausoleum at Maraq (Cat. No. 14) and the mihrab of the Mir Zabir mausoleum near Sirjan (Cat. No. 33).

Surat al-Ikhlās

The *Surat al-Ikhlās* is one of the most frequently encountered Qur'anic chapters in the stucco medium.⁶⁸⁹ It is short and accordingly often employed for short inscription bands in mihrabs for isolated stucco panels, in different inscription styles. The message of the chapter emphasizes the oneness of God. Some examples of the chapter are found on the external mihrab of the Turbat-i Jam complex (Cat. No. 30) and its several repetitions at the Pir-i Bakran mausoleum (Cat. No. 2).

Surat al-Fatiha

The Opening chapter excerpts from the Qur'an are some of the most frequently encountered Qur'anic excerpts in Ilkhanid stuccos.⁶⁹⁰ These excerpts were produced in numerous inscription styles, revetment forms and placed on diverse locations. The content of the Opening chapter provides the statement regarding the oneness of God and the significance of God's Prophet. The chapter opens the Qur'an and it is also its one of the shortest chapters. It plays a significant role in the Muslim religion and it is one of the most frequently memorized Qur'anic chapters. The chapter is employed by craftsmen in different types of revetments: isolated stucco panels on supporting walls, framing inscription bands and mihrab repertoires. At Pir-i Bakran (Cat. No. 2) *Surat al-Fatiha* is used as the background filler for the historic inscription on the stucco lunette of the mausoleum's burial chamber. At the Isfahan Friday mosque it is placed in the framing inscription of the Small stucco mihrab (Cat. No. 1). At Farumad Friday mosque (Cat. No. 16), an inscription band decorates the passage opening in the *qibla iwan*. The chapter was most frequently employed for mihrabs. The Opening chapter was often used in the stucco medium due to the importance of its content and its significance as the Qur'anic text but also for practical reasons dictated by its length.

Surat al-Tawba

Surat al-Tawba, the chapter of repentance, is a frequently featured Qur'anic chapter in the Ilkhanid period and it is often found on stucco mihrabs and independent stucco panels. The frequently featured verses comprise verses 18-19, 9-22, 62-63.⁶⁹¹ Verses 18-19 occur particularly often, perhaps because they concern the significance of mosques. The predilection for this chapter might stem from the political and religious significance of patronage of stucco revetment repertoires for religious structures, as expressions of the patrons' commitments to pious activities, and to the spread of Islam through patronage of religious structures and pilgrimage complexes. Some examples of excerpts of the chapter comprise the Bistam Friday

⁶⁸⁸ Compare to Dodd and Khairallah 1981, Vol 2, 70-72.

⁶⁸⁹ Compare to *Ibid.*, 151-155.

⁶⁹⁰ Compare to *Ibid.*, 3.

⁶⁹¹ Compare to *Ibid.*, 43-60.

mosque (Cat. No. 18), the mihrab of the Marand Friday mosque (Cat. No. 22), and the Bayazid Bistami complex monumental mihrab (Cat. No. 19).

Surat al-Mu'minun

The *Surat al-Mu'minun* is found in several stucco revetments of the Ilkhanid period. It most frequently occurs on stucco mihrabs in middle or smaller size inscriptions. The verses employed on Ilkhanid stuccos comprise verses 1-13.⁶⁹² The chapter is normally given lesser to middle prominence in mihrabs and it normally constitutes the thematic background of epigraphic repertoires. The excerpt is featured on the mihrabs of Tabriz (Cat. No. 24) and Urumiya (Cat. No. 23) Friday mosques, at the Bayazid Bistami complex mihrab (Cat. No. 19) and at the mihrab of Pir-i Bakran mausoleum (Cat. No. 2).

Surah Ya-sin

Surah Ya-sin is one of the frequently employed inscriptions in Ilkhanid stucco. The most frequently used verses are verses 1-15, from the beginning of the chapter.⁶⁹³ They regard the significance of God, his message, the significance of the Prophet and the punishments for the disbelievers. Due to the short forms of verses, the chapter excerpts could be featured on short inscription bands used to frame isolated stucco panels, but a larger number of verses made it suitable for the inscription bands of mihrabs and isolated monumental inscription bands. One of the longest examples of the chapter in carved stucco is the monumental inscription in the Kirmani mosque of the Turbat-i Jam complex (Cat. No. 30). Further examples comprise the mihrab of the Sava Friday mosque (Cat. No. 34), and the mihrab of the Farumad Friday mosque (Cat. No. 16).

Surah Hud

The *Surah Hud* is frequently employed in Ilkhanid stucco epigraphic programmes, especially in mihrabs. The main theme of the chapter is God's suzerainty over all creatures on Earth, the need to worship only him and to perform duties ascribed to the Muslim believers. In its composition, the chapter contains messages found in the Throne verse, *Surat al-Insan*, *Surah Ya-sin* and related chapters. But the selected verse for Ilkhanid stuccos comprise verses 73 and especially verses 114-115; they regard the significance of the prayer and rewards for believers.⁶⁹⁴ These verses of the chapter were selected based on their content in order to encourage the performance of prayers in monuments where stuccos are located. Some examples of the use of the chapter excerpts are found on the mihrabs of the Kucha-yi Mir mosque (Cat. No. 31) and the Friday mosque of Bistam (Cat. No. 18).

Surat al-Hashr

The chapter of banishment occurs on Ilkhanid carved stuccos with a medium frequency, especially on mihrabs and monumental inscriptions. Its central theme is the power of God in aiding the believers and the event of the exile of the Jewish al-Nadhir tribe, due to their mutiny

⁶⁹² Compare to Dodd and Khairallah 1981, Vol 2, 83.

⁶⁹³ Compare to *Ibid.*, 103-104.

⁶⁹⁴ Compare to *Ibid.*, 62.

against the Islamic state. But the most frequently selected verses for Ilkhanid stuccos comprise verses 21-24.⁶⁹⁵ The employed verses in stucco are from the last part of the chapter, which specifically refers to the question of the significance of the Qur'an, the attributes of God and the real demand of the faith, explained to those who are devoid of the true spirit of the religion. Examples of excerpts from this chapter have been documented at the Ushturjan Friday mosque (Cat. No. 4), the Gunbad-i Sabz in Qum (Cat. No. 15), the Jawin Friday mosque (Cat. No. 20) and the Sujas Friday mosque (Cat. No. 35).

Surat al-Jum'a

The *Surat al-Jum'a* treats the theme of the congregational prayer on Fridays and urges the believers to observe it and to remember God. The specific topic of the chapter rendered its verses some of the most frequently featured Qur'anic excerpts on revetments in congregational mosques. For Ilkhanid stuccos, verses 1-7, and especially 9-10, were most frequently employed; they regard the theme of the significance of the Friday prayer. These excerpts were employed for stucco mihrabs and also monumental inscriptions. Perhaps the best example of the inscription was documented on the no longer extant mihrab of the north-western prayer hall of the Kashan Friday mosque (Seljuq or Ilkhanid?), where it is featured on the monumental trefoil arch forming the mihrab's specific design. Further examples comprise mihrabs of the Bistam Friday mosque (Cat. No. 18) and the varamin Friday mosque (Cat. No. 28).

b.) The Less Frequently Occurring Qur'anic Chapters

Surat al-Nur

The chapter of Light is one of the most frequently employed chapters of the Qur'an in Islamic art and architecture throughout the history of the religion and in the majority of Islamic lands.⁶⁹⁶ The chapter emphasizes characteristics and symbolic understanding of God as light and other attributes. For these reasons *Surat al-Nur* is frequently employed for the decoration of mosque lamps or objects which reflected light. The chapter is also frequently reproduced on mihrabs, as the gates to God and therefore the lamp found in Islamic mihrab niches alludes to their function as leading to God. One of the few examples of the chapter excerpt in Ilkhanid carved stucco medium is found in the stucco ceiling of the *shah nishin* in the northern *iwan* of the Isfahan Friday mosque (Cat. No. 1).

Surat al-Qalam

Surat al-Qalam is a longer chapter, which makes it suitable for long framing inscription bands. The inscription is occasionally employed for Ilkhanid stuccos, on mihrabs. Employed verses comprise verses 51-52, from the end of the chapter. The chapter is rarely used for inscriptions on Islamic monuments.⁶⁹⁷ The only instance of occurrence of verses from this chapter has been documented at the Haftshuya Friday mosque (Cat. No. 3).

Surat al-Insan

⁶⁹⁵ Compare to Dodd and Khairallah 1981, Vol 2, 130-131.

⁶⁹⁶ See *Ibid.*, 84-87.

⁶⁹⁷ See *Ibid.*, 137.

The *Surat al-Insan* is one of the less frequently employed Qur'anic excerpts in Ilkhanid stucco and also in a wider geographical and chronological context. The chapter is long, and selected verses, especially 1-8, are from the beginning of the chapter. The chapter regards the theme of creation of the man and the mankind, the society the Muslim believers live in. But the particular verses regard the question of creation of humankind and punishments for disbelievers. *Surat al-Insan* is one of the most significant Qur'anic excerpts featured on Ilkhanid architectural revetments,⁶⁹⁸ but it occurs less frequently in carved stucco medium. It is frequently given prominent position in epigraphic repertoires. The chapter excerpts were used for stucco mihrabs and inscription bands alike. The length and the possibility of the choice of verses allowed for the inscriptions to be longer and for this reason it was especially suitable for inscriptions, which ran along supporting walls and framing inscription bands of mihrabs. Some examples are found at Pir-i Bakran (Cat. No. 2), Ushturjan (Cat. No. 4) in stucco, and at Natanz (Cat. No. 12) in lustre tile media.

Surat al-Hajj

Surat al-Hajj treats the theme of behaviour and performance of duties of pious Muslims and consequent rewards and punishments for disbelievers. The main topic of the chapter concerns one of the five pillars of Islam, the pilgrimage to Mecca, with its performance described. The verses of the chapter, especially verse 77, which regards the significance of prayer for believers, are featured in Ilkhanid stucco repertoires, above all on stucco mihrabs, but with a lesser frequency.⁶⁹⁹ Some examples of the inscription comprise the mihrab of the Sava Friday mosque (Cat. No. 34) and the Farfan Friday mosque mihrab (Cat. No. 5).

Surah Yunus

The chapter of Jonah concerns the theme of the belief in God and the afterlife. Excerpts from the chapter, especially verses 62-64 and verses 105-106, were occasionally featured in stucco mihrabs.⁷⁰⁰ Some examples include the mihrab of the Kirmani mosque at the Turbat-i Jam complex (Cat. No. 30).

Hadiths

Hadith texts only occasionally occur in Ilkhanid stucco revetments, and in a small number. They have been documented on a limited number of repertoires: the Uljaytu mihrab (Cat. No. 1), the Uljaytu mausoleum at Sultaniyya (second decorative phase; Cat. No. 27), the Marand Friday mosque mihrab (Cat. No. 22), the mihrab of the Abu al-Hasan al-Kharaqani mausoleum at Qala-yi Naw (Cat. No. 21), the Urumiya Friday mosque mihrab (Cat. No. 23), the Kucha-yi Mir mosque mihrab (Cat. No. 31), the mihrab of the Imamzada Rabi'a Khatun (Cat. No. 32) the Farumad Friday mosque (Cat. No. 16) and the Mir Zabir mausoleum mihrab near Sirjan (Cat. No. 33). These repertoires, except for the Farumad Friday mosque, all date to the period after 1310 and represent later Ilkhanid repertoires of architectural revetments.

⁶⁹⁸ See Dodd and Khairallah 1981, Vol 2, 143-144.

⁶⁹⁹ Compare to *Ibid.*, 79-82.

⁷⁰⁰ Compare to *Ibid.*, 61.

In the case of the Uljaytu mihrab and the mausoleum, Hadiths of specific kinds were likely connected to the Shi'ite nature of the mihrab and the mausoleum. At Kharaqani mausoleum, Urumiya, Marand, Natanz, Ushturjan, Farumad and Sirjan, Hadiths are mainly Prophetic Hadiths, which are not of Shi'ite content, and they constitute parts of epigraphic programmes which are of specific characteristics.⁷⁰¹ In carved stucco medium, different to lustre, Hadiths came to constitute parts of the epigraphic programmes at a relatively late point. In all cases, they are featured in the context of specific, out of norm, epigraphic programmes, which seem to have been chosen on purpose. This is different to the more frequently occurring epigraphic programmes on other Ilkhanid stuccos, which mainly comprise diverse selections of Qur'anic excerpts. The described situation might reflect involvement of patrons, external collaborators or learned personages in preparatory stages for these exceptional epigraphic programmes.

Names of God and Blessings to the Fourteen Infallibles

The *al-Asma' al-Husna* occur only in one case in Ilkhanid stuccos, at the Pir-i Bakran mausoleum (Cat. No. 2), in the form of the monumental Square Kufic panel which mirrors the panel of the Blessings to the Fourteen Infallibles. A similar fragmented panel with Blessings to the Fourteen Infallibles has also been documented in the Haftshuya Friday mosque (Cat. No. 3). These individual panels of Square Kufic inscriptions, which reflect square Kufic panels of the northern entrance portal of the Ushturjan Friday mosque (Cat. No. 4), might be developments characteristic of one stucco craftsmen's workshop.⁷⁰² These inscriptions likely reflect the change of the state religion to Shi'ism, with Uljaytu's conversion, and they might have been produced for this reason. The fact that they are produced with a specific artistic technique confirms that they are the works of one specific stucco craftsmen's workshop which possessed the necessary knowledge for their making.

Conclusion

This section concerning inscriptions of Ilkhanid stuccos can be concluded with some remarks regarding their specific characteristics. It has been shown that during the Ilkhanid period, the inscription style used for carved stuccos changed, compared to pre-Ilkhanid stuccoworks. Square Kufic and *Khatt-i banna'i*, as well as *Naskh* and *Thuluth* styles, became more frequently employed. While the content of the Qur'anic excerpts on the inscriptions in stucco medium does not differ considerably from pre-Ilkhanid periods, it nevertheless features some specific characteristics of selected excerpts which were not employed in pre-Ilkhanid stuccos. Moreover, content of Qur'anic excerpts and Hadiths differs considerably from revetments in other media of the Ilkhanid period, which likely reflects specific practices of stucco craftsmen's workshops, which worked separately from other media workshops. Moreover, in some cases, workshops retained their own bulk of Qur'anic inscriptions for production of inscription bands, rather than consulting experts to compose or select inscriptions for every commission. It has also been shown that Hadiths occur more frequently in carved stuccos, compared to what has been believed, but the majority of these Hadiths are generic Prophetic Hadiths, rather than

⁷⁰¹ The Marand mihrab (Cat. No. 22) for example contains two lengthy historic inscriptions. The Kharaqani mihrab (Cat. No. 21) comprises texts in Persian, related to the works of the revered Shaykh buried in the complex. Both repertoires are works of the later Ilkhanid period, from the time of the reign of Abu Sa'id when the official religion of the Empire was Sunni Islam.

⁷⁰² A slight possibility exists that they could be later modifications of decorative programmes of the monuments.

pointed Shi‘ite texts. The specific religious aspects of the function of the monuments were occasionally determined by production of specific inscription compositions which occur less frequently in carved stuccos.

3.4 Characteristics of Ilkhanid Stuccos’ Aesthetics and Visual Appearance

Background

This research demonstrates that it is difficult to consider examined stucco repertoires as pertaining to one Ilkhanid style. Moreover, consideration of stuccos as works of regional schools or in terms of their regional characteristics would be equally erroneous, due to the demonstrated intra-regional and trans-regional migration of stucco craftsmen workshops (see Chapter 4; Section 4.4). It has also been shown that each stucco workshop retained its specific knowledge for production of stuccos and their own repertoire of employed epigraphic styles, geometric compositions and abstracted vegetal elements. Characteristics of the visual appearance of stuccos should therefore be comprehended as differing from workshop to workshop. They can accordingly be divided into nine main groups of Ilkhanid stucco repertoires (see below). In fact, the visual characteristics of Ilkhanid stuccos differ considerably between these different workshops; some of them are more similar to the Seljuq stuccos and others more characteristic of the perceived Ilkhanid style. These stuccos are frequently contemporaneous and they demonstrate that there was no quick evolution of stucco style and neither of stucco production technology. Rather, stuccos of differing appearance were produced in parallel. Characteristics of the Ilkhanid stuccos’ visual appearance and their style can thus be defined only vaguely and are not always concurrent to all the Ilkhanid stucco repertoires (see Chapter 6 Section 6.2).

a.) Stuccos of the Damghani Family and Related Repertoires (Jawin, Damghan, Bistam, Qala-yi Naw, Farumad, Khusraw Shir)

Fig. 35.

Stuccos of monuments located in Jawin, Damghan, Bistam, Qala-yi Naw, Farumad and Khusraw Shir (Cat. Nos. 16-21) share characteristics of their production, design, and visual appearance. They can be considered as stuccos of style characteristic of the geographical area stretching between Simnan and Farumad. Chronologically, the Farumad and Khusraw Shir repertoires are the oldest and likely examples of stuccos from the Early Ilkhanid period (1256-1295). They are followed by stuccoworks signed by the Damghani stucco craftsmen’s family located in Damghan and Bistam (Cat. Nos. 18-19). Later works, such as stuccos of Jawin and Qala-yi Naw (Cat. Nos. 20-21) are closely related to earlier repertoires and could be works of craftsmen connected to the Damghani family.



Stuccos of the Bayazid Bistami complex; Ilkhanid Congregational mosque



Stuccos of the Entrance Portal of the Burj-i Kashana, Bistam



Stuccos of the Friday mosque of Bistam

Figure 35: Comparison of visual features of Damghani family-produced stucco repertoires.

These stucco repertoires were produced with a similar selection of stucco artistic techniques (mainly carving of one stucco layer, selective application of protruding elements and occasional carving of more than one layer of stucco), they are signed by craftsmen in similar manners (often in highlighted cartouches either topping mihrabs or on other focal points of monuments) and they display similar features of stucco reliefs and visual elements. They are characterized by shallow stucco reliefs, which comprise one visual plane, which is occasionally interrupted by protruding elements. Inscription styles employed for epigraphic programmes of these stuccos comprise frequent use of *Naskh* which is often combined with diverse types of Kufic. *Naskh* is employed at a greater frequency, compared to the Seljuq repertoires and Kufic was consciously employed for invocations to God for shorter length inscription cartouches and occasionally, to visually frame mihrabs in form of monumental inscription bands. In Ilkhanid stuccos, purely geometrical panels of designs or geometrical elements are less frequently employed, compared to more frequent use of vegetal compositions, which is different from the Seljuq period. Strongly geometrical appearances of the Farumad Friday mosque mihrab may in fact reflect its early date and closer ties to Seljuq stucco designs, although it retains specific geometric compositions of repeating Kufic inscriptions, which have not been found elsewhere.

These stucco repertoires are characterized by a large number of differing inscription bands, which are juxtaposed to backgrounds filled with abstracted vegetal elements or vegetal scrolls. Other stuccos of this group reveal use of diverse geometric patterns for parts of the repertoires, which are less frequent in other Ilkhanid stucco groups and might also appear somewhat archaic and closer to Seljuq stuccos. One of the exemplary geometric patterns of these stuccos is the geometric grid formed with an abstracted vegetal element of an angular four-leaf clover. Other characteristic elements comprise use of visual frames of geometric forms to delineate inscription cartouches or stucco panels. Differently from stuccos in central Iran and other regions, palmette or half-palmette elements do not occur frequently in these stuccos (except from when they are protruding elements). Rather, abstracted vegetal elements of these repertoires comprise various types of twisted leaf elements and frequent use of flower blossoms abstracted into rosettes with a differing numbers of petals. These elements can be considered specific to the discussed group of stuccos and are rarely found in other stucco groups. They considerably differ from their Seljuq counterparts: the level of detail of stucco design compositions and carving of these stuccos is substantially more detailed.



Figure 36: Comparison of design forms of mihrabs at Urumiya (left) and Marand (right) Friday mosques.

b.) Stuccos in North-Western Iran (Urumiya, Marand and Tabriz)

Three main stucco repertoires have been discussed in the area of north-western Iran: stucco mihrabs of the Urumiya, Tabriz and Marand Friday mosques (Cat. Nos. 22-24). Although these three repertoires are all located in one geographical area and are not distant from each other, their features differ considerably, because they are produced by different workshops.

Urumiya and Marand Mihrabs

Fig. 36.

The Urumiya mihrab features the date 1277, but it covers an earlier mihrab of the Seljuq or Ilkhanid period and it is difficult to ascertain whether the mihrab was thoroughly refurbished in Qajar times.⁷⁰³ The Urumiya and Marand (1330-31) mihrabs share important features of mihrab design, although they are signed by different stucco masters, but in a similar location and manner. The two mihrabs display the same form of interior niches, comparable forms of monumental columns forming lunettes and the same number of framing bands and similar types of horizontal panels of repeating abstracted vegetal reliefs topping the mihrabs, but their proportions are different. This research proposes that the two master craftsmen responsible for the production of the mihrabs either trained or collaborated together, or more likely, that one was the disciple of the other. If so, they could have used a related template or design for the two mihrabs. It is interesting to note that the two mihrabs are produced with different selections of stucco artistic techniques and that they feature differing inscription styles. The Urumiya mihrab is characterized by a monumental Kufic band which comprises elements of star design and elaborate finishes of its *hastae*. It also features a specific artistic technique of stucco carving which combines production of a perforated grill and application of hollow protruding elements. This technique has not been spotted on other stuccos of the Ilkhanid period and could be the result of later repairs to the mihrab.

Differently to Urumiya, the Marand mihrab is produced with less demanding stucco artistic techniques, which comprise the carving of stucco reliefs out of one or more stucco layers and use of applied protruding elements. Both mihrabs feature monumental horizontal panels on their tops, which protrude from the mihrabs' visual planes and which partially feature stucco undercut. Such monumental horizontal panels topping the mihrabs with repeating vegetal designs have been documented on the majority of the Ilkhanid mihrabs, such as those of the Varamin Friday mosque (Cat. No. 28), the Pir-i Bakran mausoleum (Cat. No. 2), the Ushturjan Friday mosque (Cat. No. 4) or the Haftshuya Friday mosque (Cat. No. 3). These panels, which are frequently extremely protruding and which were formed with a combination of different artistic techniques, can be proposed to be one of the characteristics of Ilkhanid stuccos.

The Tabriz Friday Mosque Mihrab

The mihrab of the Tabriz Friday mosque (Cat. No. 24) was in a badly damaged state and it has recently been partially reconstructed. The mihrab's remaining original fragments indicate that it was brightly coloured and that it featured a frequently occurring type of stucco panel design, but these panels were produced with more demanding stucco artistic techniques. This mihrab does not display shared visual or technical characteristics with the mihrabs of Urumiya and Marand Friday mosques. It is more closely related to stuccos of central Iran, with which it partially shares characteristics of visual appearance. It is likely that its makers were not native to the north-western Iranian region. The mihrab retains remains of its central monumental lunette, which was produced with specific artistic technique; its extremely deep relief is an

⁷⁰³ Hypothesis proposed by Amir Hossein Karimy, paper presented at the *I Love Persian Stucco, Lectures and Practical Workshop* conference, University of Bamberg, April 10-12, 2018.

interplay of hollow constructed applied elements and other types of applied elements, which rendered it extremely dynamic. Such or similar types of reliefs are rarely encountered in pre-Ilkhanid stucco repertoires.⁷⁰⁴ Nevertheless, the amount of protrusion, the depth of the relief and the dynamic interplay of its numerous visual planes set the Tabriz mihrab apart from these earlier repertoires. Its described features are found in other Ilkhanid stuccos, especially in the central Iranian region, and must be considered one of the characteristic features of Ilkhanid stuccos. Other fragmented parts of the Tabriz Friday mosque mihrab demonstrate that it featured cursive and Kufic inscription styles, with Knotted Kufic given a monumental form of the framing band placed against a complex design of vegetal scroll compositions. Similar to the stuccos of Urumiya and Marand, and the stuccos of the area between Jawin and Farumad, the Tabriz mihrab does not feature elements of palmettes typical of central Iranian stuccos. The Tabriz panels do not feature geometric, but abstracted floral elements comprising various types of heavily perforated leaf elements with small half-palmettes.



Imamzade of Shah Ahmad Qasim and Fatima Khatun, Qum, 1308, Square Kufic panel and the star pattern

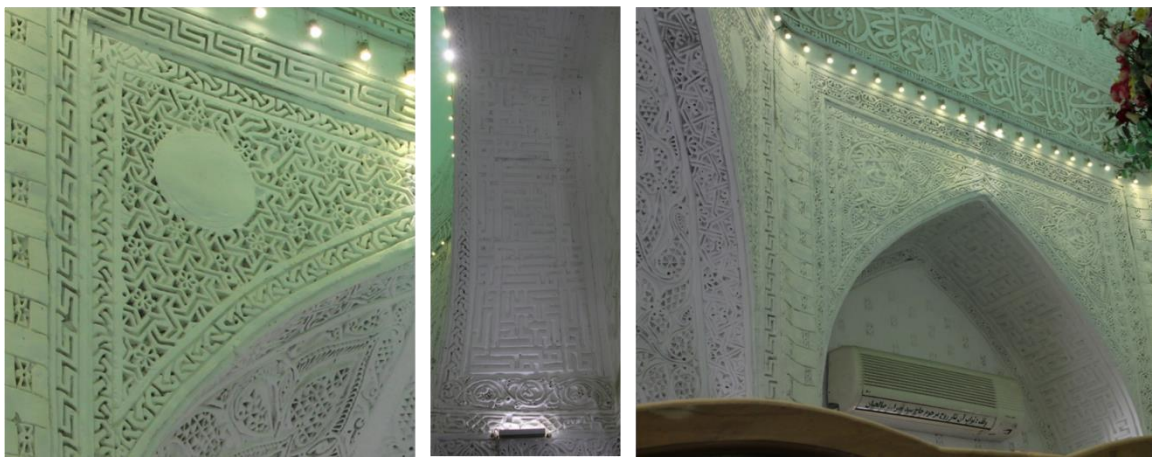


Figure 37: An example of Qum stucco repertoires: stuccos at the Imamzade Shah Ahmad Qasim and Fatima Khatun (Cat. No. 15).

⁷⁰⁴ Perhaps some of the closest Seljuq period stuccos are those of the Haydariyya madrasa in Qazvin and the Gunbad-i 'Alawiyan mausoleum in Hamadan.

c.) Stuccos of the Qum Area

Figs. 37-38.

In the city of Qum, or its immediate surroundings, some fourteen monuments of the Ilkhanid period, mausolea above all –, have been examined (Cat. No. 15). The majority of these structures display one of three types of architectural forms and they have mostly been decorated in carved stucco and occasionally with lustre tile revetments, which were removed from the sites. Observations of these stucco repertoires, all in the monuments' interiors, indicate that they display a relative uniformity and that they must have been works of a small number of stucco craftsmen's workshops above all operating in the area of Qum, presumably in isolation from other workshops. This isolation, and lack of exchange of stucco production know-how, designs, and visual elements, determined the specific characteristics and uniform appearance of stuccos in the Qum area, which should however not be understood as works of one school – or craftsmen's workshops which would be steered by a central apparatus determining the relatively uniform use of artistic forms and designs.

Stuccos of the Ilkhanid monuments in Qum display a shallow relief, which mainly features one visual plane and has rarely been produced by the carving of more than one stucco layer. They are also characterized by the lack of use of applied protruding elements. In terms of stucco production technology, these repertoires seem somewhat rudimentary and archaic, closer to the Seljuq than Ilkhanid examples, but their designs and specific combinations of diverse visual elements for their compositions are more complex, compared to pre-Ilkhanid stuccos and also specific to the given geographical area. For production of these stucco repertoires, which cover most of the interior monuments' surfaces (supporting walls, mihrabs, transitional zones and interior dome shells), carved stucco medium was frequently combined with stucco plugs carved out of a layer of stucco covering the architectural surfaces. Interior dome shells are especially interesting, because only a few of them are preserved and they might indicate how similar monuments in the other geographical regions could have been revetted. They feature a limited number of types of geometrical webs, which act as framing devices for different forms of medallions featuring epigraphic content and abstracted vegetal element compositions.

Specific to these repertoires is the use of monumental inscription bands. Styles, such as Knotted Kufic, *Naskh* and *Thuluth* are most frequently employed to produce them. Another style characteristic of these repertoires is Square Kufic, which is frequently employed to either form panels of inscriptions or specific forms of architectural elements, especially inscription bands or horizontal panels. Compared to monuments in other regions, these epigraphic repertoires are often more extensive and of larger dimensions. Their monumental bands are employed according to the specific logic of highlighting the main architectural lines of the monument interiors; the outlines of supporting wall surfaces, the top areas of supporting walls, the springing of the dome and transitional elements. These linear inscriptions are directly juxtaposed to round medallions with epigraphic content which cover walls, squinches and dome shells. The background of these repertoires, such as blind niches, wall surfaces and back of dome designs are most frequently filled with stucco plugs. In fact, this use of stucco plugs is specific, because they are combined with carved stuccos on the same architectural surfaces: in

other monuments in other regions, these different types of revetments are most frequently employed separately, rather than in combination.

In addition to inscriptions, further visual elements comprise various abstracted vegetal elements and only occasionally geometrical elements. Vegetal elements are above all employed in two manners: for inscription background, where they are not separated from inscriptions by a recessed visual plane and for the composition of medallions of circular, round and teardrop forms. For inscription backgrounds, the most commonly employed vegetal element is the floral scroll, which comprises large dimension palmette and half-palmette elements, typical of the central Iranian region. Vegetal compositions in medallions are specific to stucco repertoires of the Qum area and they are not featured in stuccos in other regions. Similar elements of designs have however been documented in other media of architectural revetments, such as wall paintings on the monuments of the Yazd region (for example, the Rukniyya; Cat. No. 29), or the applied moulded and stencilled stuccos of the Uljaytu mausoleum (second decorative phase; Cat. No. 27). Another specific trait of Qum stuccos is the heavy perforation of stucco panels, and formation of panels only by perforations functioning as background to decorative repertoires.



Figure 38: Qum, Imamzada Zayd: stuccos of late date illustrate how long the Ilkhanid Qum stucco style endured in the given geographical region.

d.) Stuccos between Isfahan and Qum (Maraq-Mahallat-i Bala-Natanz and Kashan-Qamsar-Nushabad)

Ilkhanid stucco repertoires located north of Isfahan and south of Qum, in the northern part of Central Iran, have been divided into two sub-groups, because they were produced by two distinct stucco craftsmen's workshops— their technical and aesthetic features therefore diverge. The first group consists of three repertoires, two of which are signed by the same stucco master (*Work of 'Ali Ahmad Babuya al-banna' al-Vidguli*).⁷⁰⁵ These repertoires are: the stuccos in the shrine of the 'Abd al-Samad complex in Natanz (Cat. No. 12), the stucco mihrab of the Imamzada Yahya and Fazl at Mahallat-i Bala (Cat. No. 13) and the small stucco mihrab of the Baba Afzal complex near Maraq (Cat. No. 14), north-west of Kashan. The second group of stuccos consists of three mihrabs, which are not signed, but their technical and visual features are so close to each other that they must have been produced by the same craftsmen's workshop: the 'Ali mosque in Nushabad mihrab, the mihrab of the Miyandih mosque in Qamsar and the badly damaged monumental mihrab of the Kashan Friday mosque's north-western hypostyle prayer hall, which covers an earlier painted plaster (wall painting) mihrab.



Figure 39: Visual features of Mahallat-i Bala mihrab at the Imamzada Yahya and Fazl, dated 1335-36.

⁷⁰⁵ Vidgul is a settlement located near Kashan, which formed around the Seljuq period. The *nisba* might be geographical and thus reflect the local provenance of the master craftsman and the stucco craftsmen's workshop.

Natanz, Mahallat-i Bala and Maraq Repertoires

Figs. 39-41.

The most closely associated stuccos are the mihrab of the Mahallat-i Bala Imamzada and the stuccos in the shrine of the 'Abd al-Samad complex. They are both signed (in different forms) by the same stucco master craftsman. These two stucco repertoires are both dated (Natanz: 1307-08; Mahallat-i Bala: 1335-36) and some three decades passed between their production. It is plausible that some of their differing characteristics stem from the fact that the composition of the craftsmen's workshop changed with the passing of time. Both repertoires were produced by carving of one or more stucco layers, and occasional use of applied protruding elements. Their production was performed by employing the basic stucco artistic techniques, closer to the Seljuq than Ilkhanid period. The fact that the two repertoires display differing visual features might indicate the change of ornamental style and visual characteristics of stucco revetments of the same workshop as the time passed. In both cases, stuccos are characterized by various types of heavy perforation. Employed inscriptions styles are different; at Natanz, Kufic and *Naskh* are employed, but at Mahallat-i Bala, inscriptions comprise *Naskh*, Kufic and Square Kufic styles. None of the two repertoires features half-palmettes, which were widespread in the Isfahan area and in central Iran. Instead, they feature diverse types of leaf ornamentation for the inscription background and for independent panels featuring symmetrical compositions of half-palmettes and other abstracted vegetal elements. Geometric elements are not a prerogative of these stuccos. One specific aspect of the Mahallat-i Bala mihrab is the Square Kufic inscription composition panel in the lower part of its internal niche; it features a specific design and a specific manner of production. Square Kufic has been employed in related manners above all in the stuccos of monuments in and around Qum (Cat. No. 15).

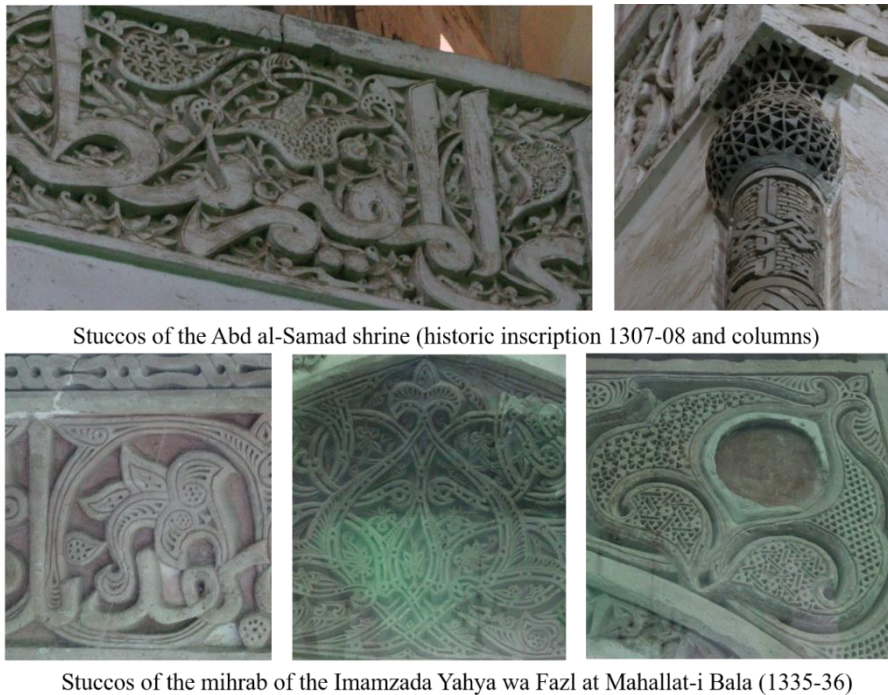


Figure 40: Comparison of visual features of stuccos at the 'Abd al-Samad complex and the Imamzada at Mahallat-i Bala.

The third stucco repertoire can be associated with the Natanz and Mahallat-i Bala mihrabs, based on comparison of its production technology and visual features. The mihrab of the Baba Afzal complex is not dated, but its association with these two stucco programmes suggests a date of around 1310-1330, perhaps closer to 1330. The Maraqq mihrab is also produced in a relatively simple manner, by carving of one or more layers of fine stucco body. Moreover, it features two panels of Square Kufic compositions, one of which is identical to the panel at the mihrab of Mahallat-i Bala. The monumental inscription band of the Maraqq mihrab displays a double incised outline, which is also part of the Natanz monumental inscription band. The mihrab of Maraqq also retains specific characteristics: the background of its inscription band is filled with peony or lotus-like elements, rather than traditional floral scrolls or palmette designs. Moreover, the Maraqq mihrab features an extensive number of palmettes and half palmettes which form the monumental lunette topping the mihrab and which are parts of symmetrical abstracted compositions in its interior niche.



Figure 41: Visual features of the Maraqq complex mihrab (Cat. No. 14).

These three stucco repertoires seem to be works performed across a time span of at least three decades, which impacted their diverging characteristics. It is worth noting that in Natanz, apart from the stuccos of the shrine of the complex, there exist two other Ilkhanid stucco repertoires; the inscription band in the northern *iwan* of the congregational mosque of the complex (Cat. No. 12) and the medium dimension mihrab in the Kucha-yi Mir mosque (Cat. No. 31). These two repertoires are signed by different master stucco craftsmen, and they display differing stylistic features compared to the stuccos of the shrine. The monumental inscription band in the

iwan of the mosque is closer to the stuccos of Isfahan, with its pervasive palmette element background and protruding nature of its relief. The stuccos of the Kucha-yi Mir mosque are to be associated with the Kirmani signed stuccos (see below), rather than stuccos of Isfahan or the given area. This is informative of the fact that at Natanz, three different stucco workshops operated and that its stuccos do not reflect the same regional style despite its close locations. This is another confirmation and argument against the concept of regional stucco schools, and illustrates that repertoires should be associated into groups according to the workshops which produced them.

Kashan, Nushabad and Qamsar Repertoires

Fig. 42.

The three carved stucco mihrabs are located in relative proximities to each other. Their design, manner of production, stucco artistic techniques, and visual elements are related to such a degree that they must be recognized as works of a single stucco craftsmen's workshop, despite the lacking signature evidence. These mihrabs were likely parts of more extensive decorative programmes. The two smaller mihrabs are located in secondary mosques of settlements and the monumental mihrab in the Kashan mosque is located in one of the extant older hypostyle prayer halls, where it entirely covers an earlier mihrab with wall paintings. The fact that this mihrab covers an older mihrab and is thus a redecoration intervention, and the fact that the other two mihrabs are located in secondary rather than congregational mosques, provides additional evidence in favour of their hypothetical Ilkhanid date. These mihrabs have been traditionally understood as works of Seljuq craftsmen, but an early, Proto Ilkhanid date would be more appropriate also drawing on their artistic techniques, stucco production technology and visual features.

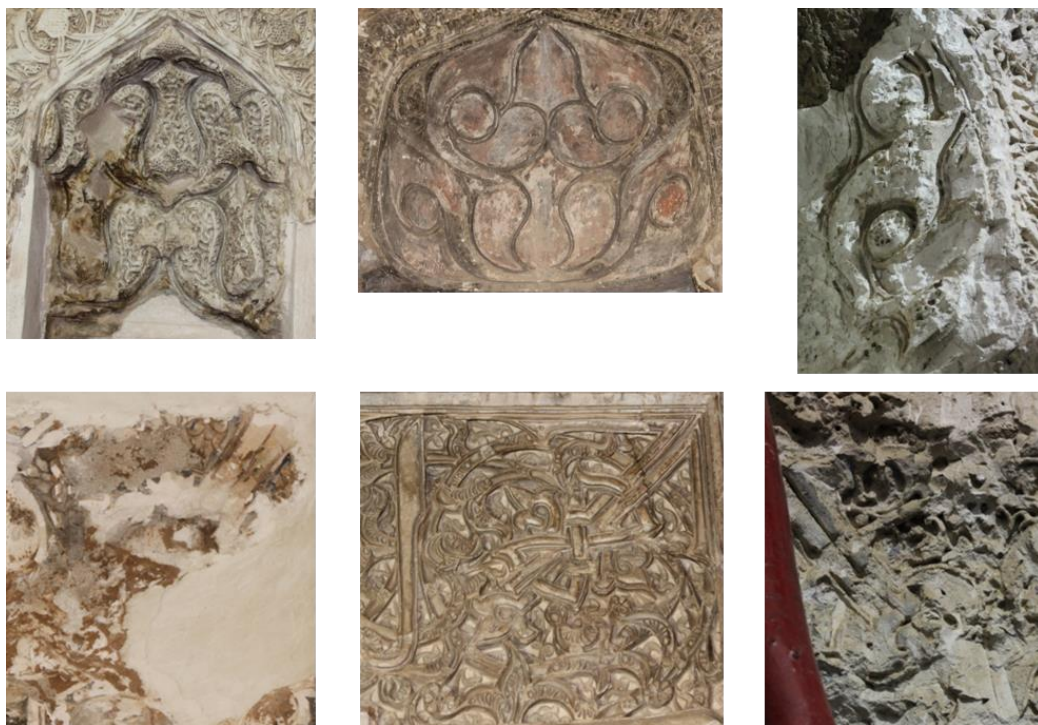


Figure 42: Comparison of visual features between Qamsar (left), Nushabad (middle) and Kashan (right) mihrabs.

These mihrabs feature different dimensions ranging from small (Nushabad), medium (Qamsar) to monumental (Kashan). Their designs and visual features are closely related; they all display a small internal niche, which is framed by an inscription band and topped by a niche formed by columns carrying segmental arches topped by pairs of spandrels and in one case a horizontal panel. These mihrab forms are outlined with monumental inscription bands. The Kashan mihrab structure is topped by the third, trefoil monumental arch flanked by a monumental pair of spandrels and visually enclosed by a large inscription band featuring Knotted Kufic style. These mihrabs display the same types of joints between different panels and they were produced with the same, yet specific, selections of stucco artistic techniques: their reliefs are carved out of one or more stucco layers, and some panels are produced to feature pseudo-undercut compositions of abstracted vegetal to geometric elements, which have been superimposed in two layers. This specific technique has not been documented on any other stucco repertoire of the Seljuq or Ilkhanid period and it should be understood as the marker of the workshop which produced them. The employed epigraphic styles of mihrabs comprise Kufic with additional ornamental *hastae* and *Naskh* and *Thuluth* with elongated *hastae*. All three mihrabs feature double incision outlines for their cursive inscriptions and related knotted elements in corners of inscription bands. The inscription bands in these styles are alternated to form dynamic compositions. Rather than with geometric, these mihrabs are mainly ornamented with abstracted vegetal elements. Vegetal elements form symmetric compositions for lunettes and spandrels with predominant elements being split palmettes. Backgrounds of inscription bands are filled with complex leaf and scroll compositions. The described visual features of these mihrabs have already been mentioned by Shani, correctly, as typical of the given geographical region of the surroundings of Kashan, but suggesting that these works date to the Seljuq period.⁷⁰⁶

e.) Stuccos Near Isfahan (Ushturjan, Pir-i Bakran, Haftshuya, Farfan, Kuhpaya, Uljaytu mihrab)

Figs. 43-44.

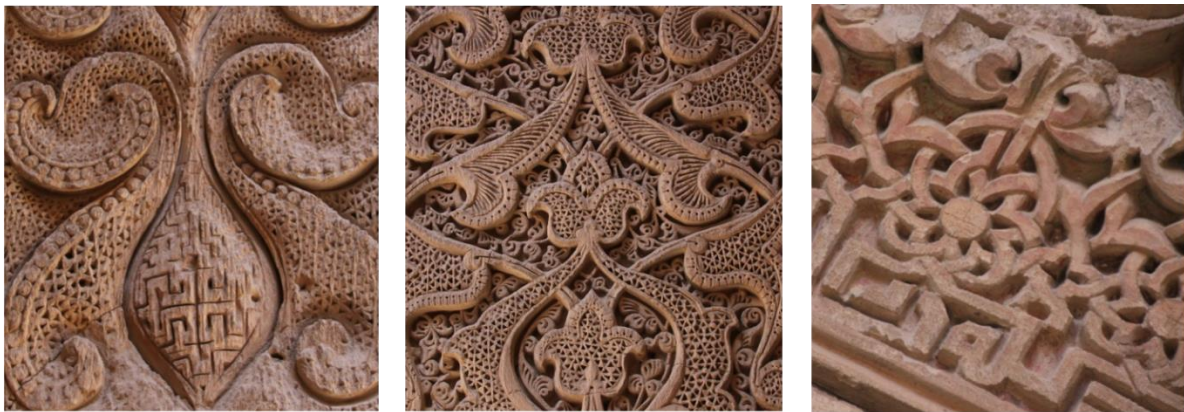
The area of Isfahan is significant for the understanding of Ilkhanid stuccos because it is home to several important monuments with stucco repertoires. The most important and closely related repertoires comprise stuccos of the Ushturjan Friday mosque, the Pir-i Bakran mausoleum and the Haftshuya Friday mosque (Cat. Nos. 4, 2, 3). Two further related repertoires are located in the given area: the Farfan and the Kuhpaya Friday mosques (Cat. Nos. 5, 8). Stuccos of the Gar Friday mosque (Cat. No. 7) are somewhat specific in their style and those of the Pa Minar mosque at Zavara (Cat. No. 6) are difficult to associate with other stuccos of the region because they present an individual development. The Uljaytu mihrab is a specific case of a monumental commission (Cat. No. 1).

Ushturjan, Pir-i Bakran and Haftshuya Repertoires

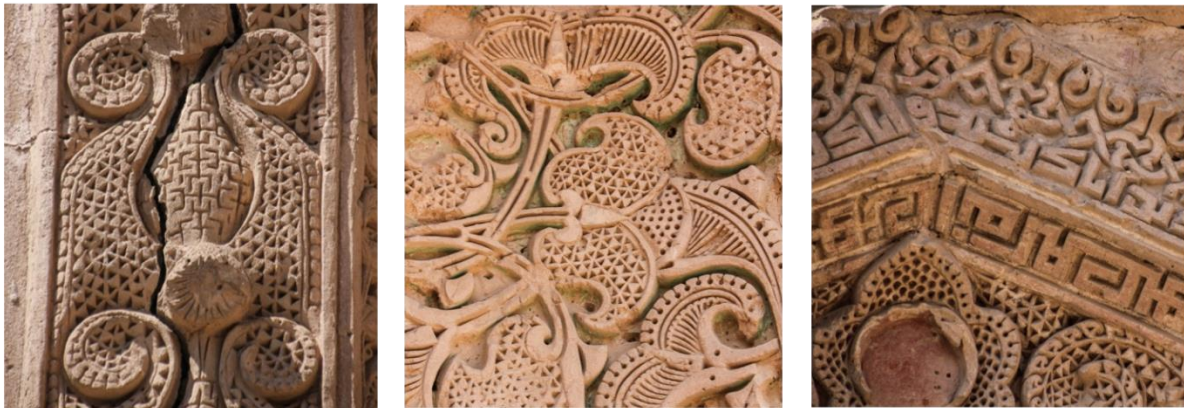
The majority of stuccos at the Ushturjan Friday mosque, an extensive part of the stuccos from the third decorative phase at Pir-i Bakran and the stucco mihrab and lunettes of the Haftshuya Friday mosque, are so closely related that they must be works of the same workshop. They are produced with the same artistic techniques, they display similar characteristics of reliefs, related

⁷⁰⁶ Shani 1989.

types of inscription styles and visual elements. These repertoires thus indicate works of a regionally mobile stucco craftsmen's workshop. Due to the early publications of the Ushturjan Friday mosque inscriptions and revetments and several articles concerning the Pir-i Bakran mausoleum, these stucco repertoires came to be understood by the Western audience as some of the best examples of Ilkhanid stucco revetment style. Due to the lack of in-depth comprehension, especially in the case of the Pir-i Bakran mausoleum, they were judged as exuberant, chaotic and as illogical assemblages of different styles and techniques. Despite this misjudgement, stuccos found in these monuments came to be considered as representative of Ilkhanid period. Although this is true to a certain extent, these stuccos nevertheless reflect characteristics of stucco know-how by the workshop which produced them and which was mobile in the Isfahan area, rather than a universal Ilkhanid stucco style.



Stuccos of the Pir-i Bakran mausoleum



Stuccos of the Haftshuya Friday mosque

Figure 43: Comparison of visual features of the Haftshuya Friday mosque mihrab and third decorative phase stuccos at the Pir-i Bakran mausoleum (1312-1313).

The Ushturjan, Pir-i Bakran and Haftshuya stuccos share numerous features. Compared to other groups of stuccos, they were produced with a wider selection of stucco artistic techniques, which comprised: carving of stuccos out of one or more layers, application of protruding elements, applications of constructed hollow protruding elements, application of applique stucco elements and stucco undercut. Combinations of these techniques enabled the craftsmen to produce stuccos with specifically deep reliefs and strongly protruding stucco panels. These stucco reliefs are contemporary to stuccos of monuments, such as those in the area of Damghan

or Bistam, but they strongly differ from them in technological and visual ways. The three stucco repertoires employ predominantly cursive styles of inscriptions, such as *Naskh* and *Thuluth*. Kufic is given a secondary significance and occasionally it functions to fill inscription backgrounds. A specific type of inscription style used on these stuccos is Square Kufic, which is found in three different types of use: as independent stucco panels (Pir-i Bakran, Haftshuya), as independent inscription bands (all three repertoires) and specifically to the region, as bands employed in stucco panels with abstracted vegetal compositions. These stucco repertoires retain only exceptionally geometric elements or patterns, and the non-epigraphic stucco panels display various types of symmetric compositions, in which palmettes and half-palmettes are the two most dominant elements. Another specific aspect of ornamental iconography of these stuccos is the pearl border which is employed on several stuccos. In sum, the specific aesthetics of these stuccoworks are deep and protruding reliefs, which are frequently undercut, and which highlight the plasticity of stuccos. In their visual appearance, these stuccos retain frequent use of palmette and palmette-derived elements, and specific iconographic elements such as the pearl border or the Square Kufic bands of small dimensions. Although the visual elements of compositions of these stuccos are commonly found in central Iran, the characteristics of stucco relief and production in the Isfahan area differ considerably from other stuccos discussed in this work.

Furthermore, decorative repertoires of Ushturjan and Pir-i Bakran reveal additional similarities in the use of glazed revetment media. These two repertoires display specific artistic techniques, such as a combination of carved stuccos and glazed elements, which are found in a restricted number of monuments.⁷⁰⁷ The Ushturjan signature of the tile cutter bares the *nisba* Tabrizi, which may point to the origin of the glazed revetment craftsmen's workshop. But rather than arriving from Tabriz directly, these craftsmen, as demonstrated in this research, first worked on the monumental project of the first decorative stage of the Uljaytu mausoleum in Sultaniyya (Cat. No. 27). Only later did some of them migrate to Varamin (Cat. No. 28), and others to Natanz (Cat. No. 12) and Ushturjan, and as shown, to Pir-i Bakran.

Farfan and Kuhpaya Friday Mosque Mihrabs

The two stucco mihrabs of Farfan and Kuhpaya Friday mosques near Isfahan display some features which allow them to be associated with the group of Pir-i Bakran, Ushturjan and Haftshuya stuccos. The Farfan mihrab was likely produced in two phases, or, possibly, the original mihrab could have been redecorated in the area of its monumental lunette which protrudes from the visual plane of the majority of its panels.⁷⁰⁸ These stucco panels are characterized by an extensive number of inscription bands featuring Knotted Kufic, Square Kufic, Plain Kufic and *Naskh* styles.⁷⁰⁹ The monumental lunette panel features a composition characteristic of central Iran: a symmetrical composition consisting of diverse palmette-derived elements. Palmette and leaf elements are also employed for other vegetal panels of the mihrab. The Kuhpaya mihrab is of a small dimension, but it might have originally been larger. Its panels

⁷⁰⁷ The linear distance between the two monuments amounts to less than 8 km, which makes it highly plausible that the two decorative repertoires are works of the same stucco and tile craftsmen's workshop.

⁷⁰⁸ It fact, it cannot be excluded that the majority of the mihrab could date to the late Seljuq period, although an early Ilkhanid date is equally plausible.

⁷⁰⁹ Use of Square Kufic for one of the mihrab's inscription bands could be interpreted as an element in favour of the mihrab's Ilkhanid date.

display only cursive inscription style and diverse palmette and vegetal element compositions. Visually, the mihrab can be associated with the stuccos of the Isfahan group, although the skills of its craftsmen were evidently more modest.

The Uljaytu Mihrab

Research of the Uljaytu mihrab (Cat. No. 1) illustrates that this stuccowork also reflects the majority of characteristics of stuccos in the Isfahan area, although it is produced with a more restricted selection of stucco artistic techniques, and it does not feature some characteristics which are frequently encountered in other Isfahani stucco repertoires.

The Uljaytu mihrab and its visual features

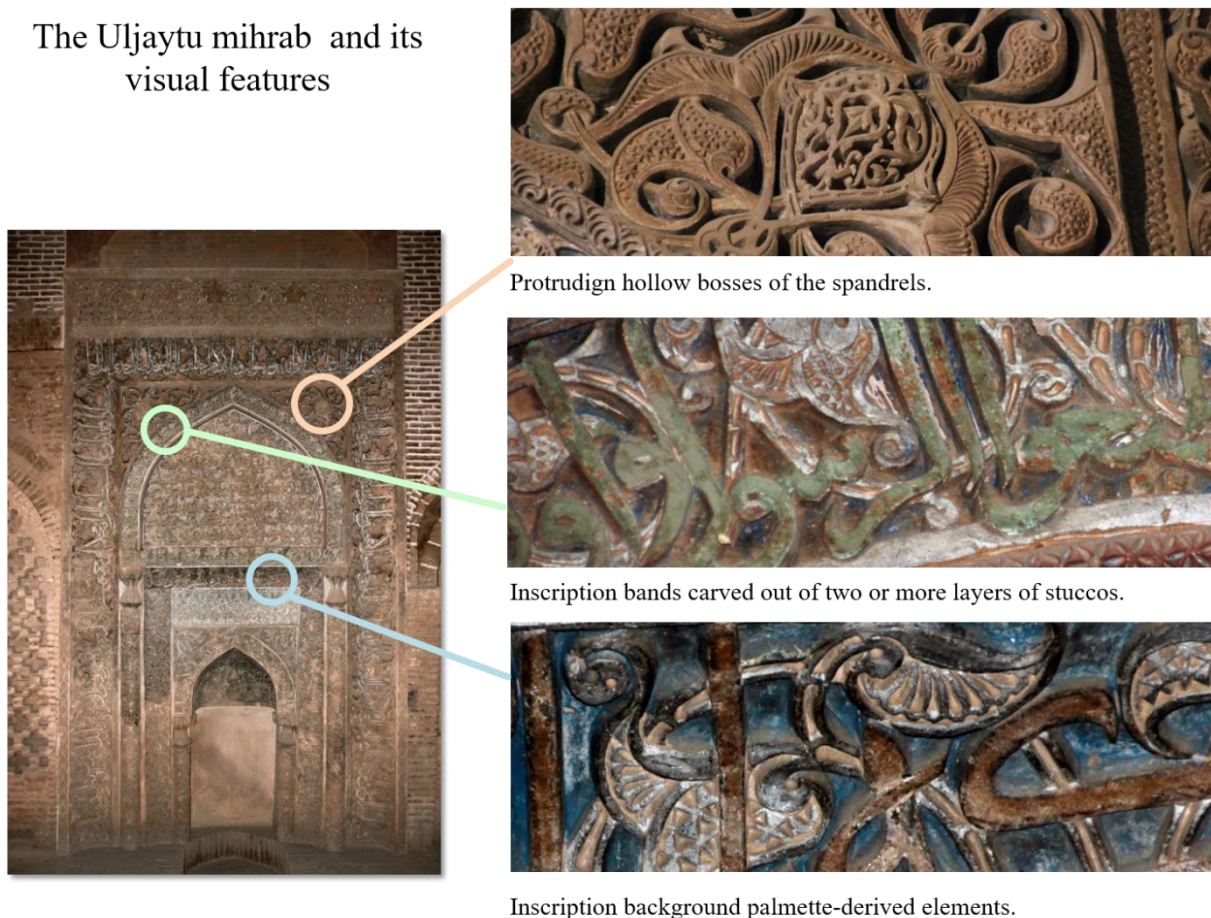


Figure 44: The Uljaytu mihrab and its visual features.

The mihrab was produced by carving of one or more stucco layers, application of protruding elements in palmette forms and use of two hollow protruding elements for its spandrels. But the panels of the mihrab do not feature stucco undercut or extremely protruding panels with abstracted vegetal ornamentation. The interplay of inscription bands was carefully thought out; *Naskh*, *Thuluth* and Kufic alternate to produce the dynamic and elegant composition and design of the mihrab. The mihrab displays visual elements which are frequently encountered on other stuccos of the Isfahan area and also on the majority of stuccos in central Iran. Its non-epigraphic panels retain different compositions of palmettes and half-palmettes. But the repertoire of visual elements is wider compared to the majority of Ilkhanid stucco mihrabs. It also comprises arabesque bands of abstracted flower blossoms framed by further bands. Nevertheless, the

predominant visual elements of the mihrab remain diverse forms of palmettes and half-palmettes. Lack of stucco undercut and some visual elements in the Uljaytu mihrab, compared to the other stuccos of the Isfahan region indicates that these stuccoworks were produced by different workshops, which operated in the region. This is partially confirmed also by different signatures of stucco masters (compare: the Pir-i Bakran to the Uljaytu mihrab signatures), which provide the identity of two of these workshops.

In sum, the shared and distinctive features of stuccos in the area of Isfahan are: specifically deep and protruding stuccos reliefs, with frequent stucco undercutting and application of protruding elements, which comprise protruding constructed elements. Use of these artistic techniques enabled the craftsmen to produce complex designs on stucco reliefs of variegated depth and protrusion, and thus featuring several visual planes. Visual features of these stuccos reveal predominance of cursive over angular inscription styles, with *Naskh* being the most frequent type of cursive inscription style, which is occasionally substituted by or combined with *Thuluth*. These stucco repertoires frequently feature Square Kufic style, which was employed creatively from independent panels, to inscription bands and also as elements of more complex abstracted vegetal compositions. The high frequency of use of Square Kufic in carved stucco is a specific characteristic of Isfahani stuccos. These stuccos rarely feature geometric designs and most frequently the non-epigraphic panels consist of symmetric compositions with predominant motifs of palmettes and half-palmettes.

f.) Stuccos Signed by Kirmani Craftsmen (Natanz, Ushturjan, Sirjan and Turbat-i Jam)

Fig. 45.

The stuccos at the Kucha-yi Mir mosque in Natanz (c. 1320; Cat. No. 31), the Imamzada Rabi'a Khatun in Ushturjan (now in Teheran National Archaeological museum; 1308-09; Cat. No. 32), the mausoleum of Mir Zabir near Sirjan (c. 1320-1330; Cat. No. 33) and the extensive programmes at the Turbat-i Shaykh-i Jam complex in Turbat-i Jam (1327-28; Cat. No. 30) are signed by different stucco masters with the shared *nisba* Kirmani. Salihi, Bahareh Taghavinejad and Zahra Rashidniya propose that these masters pertain to one family and that the stuccoworks should be considered as works of one stucco school.⁷¹⁰ This research however argues that these stucco masters lead separate workshops, but that they likely trained together and that they could be loose family members.

The two mihrabs of the Turbat-i Jam complex are signed by the same stucco master and they reveal close affinities in terms of their production know-how, artistic techniques, design and visual elements (epigraphic styles and vegetal elements, with occasional geometric bands). Such close similarities between these stuccos are a rare case and they illustrate the level of similarity of stucco repertoires produced by the same craftsmen's workshop. They are in fact not encountered in other Kirmani-signed works and they therefore provide evidence in support of the argument that the group of stuccos with these signatures is the work of several distinct, yet partially related, workshops. The two lengthy signatures of Turbat-i Jam in fact indicate the possibility that the stucco master responsible for these two repertoires could be the grandson of

⁷¹⁰ Salihi, Rashidniya and Taghavinejad 2018.

the stucco master who headed the production of the Ushturjan monumental mihrab (see Chapter 4; Section 4.2). In fact, some two decades passed between the making of these two mihrabs. It however remains unclear whether the stucco master of the Natanz mihrab had also family ties to these two stucco masters, and the signature of the Sirjan repertoire is no longer legible and thus the exact identity of its stucco master cannot be established. These repertoires were produced in a span of twenty to thirty years, indicating a gradual development of the style. Nevertheless, the basic schemes of their design and visual features evolved only gradually, yet there is a considerable difference between the earliest (Ushturjan) and presumably the latest (Sirjan) of these stuccoworks. These stucco repertoires are also located at considerable distances, which makes it more plausible that they are works of distinct workshops, because the research on other Ilkhanid repertoires illustrates that the mobility of Ilkhanid stucco craftsmen would only exceptionally reach such distances.



Stuccos of the Imamzada Rabia' Khatun mihrab 1308



Stuccos of the Kucha-yi Mir mosque, Natanz, c. 1320



Stuccos of the Kirmani mosque of the Turbat-i Jam complex, c. 1325-28

Figure 45: Comparison of the visual features of some stucco repertoires signed by craftsmen with the *nisba* Kirmani.

These stucco repertoires were produced with a restricted selection of stucco artistic techniques, which mainly consisted of the carving of stucco out of one or more stucco layers and application of circular protruding elements. Unlike stuccos of the Isfahan and central Iranian areas, Kirmani stuccos do not feature extremely protruding reliefs of variegated depths and neither stucco undercut or frequent use of applied protruding elements. Instead, they mainly retain relatively flat stucco panels, with reliefs of limited depth. These stuccos present related designs of

mihirabs, consisting of pointed arch-formed internal niches enclosed into larger niches. One specific and unique aspect of the Sirjan mihrab is also the tooth-like indentation which outlines its interior niche. Applied circular protruding elements are always systematically employed for spandrels of mihrabs to accentuate the symmetric appearance of mihrab designs.

Yet, looking at details of visual features of these stucco repertoires, they reveal considerable disparities. Each repertoire employs slightly different forms and styles of inscriptions. The Ushturjan mihrab features a combination of cursive and Kufic styles, which differ from Knotted Kufic found at Natanz, whereas the Turbat-i Jam stuccos employ cursive inscriptions in *Naskh* of extreme fluidity and considerably elongated *hastae*. Further differences between these repertoires concern their vegetal elements, which prevail over rarely employed geometric patterns. Mihrabs of these repertoires reveal some similarities in designs of their lunettes which feature compositions of palmettes and half-palmettes distributed over different visual planes. A close look at these compositions reveals considerable differences between them, for example between the Ushturjan, Turbat-i Jam and Sirjan lunettes. Similar differences were observed in compositions and vegetal elements of spandrels of these mihrabs, with the most obvious differences occurring between the Ushturjan, Natanz and Sirjan mihrabs.

On the other hand, these stuccos also share some details of their ornamental features. In addition to palmettes and half-palmettes (employed frequently in central Iranian stuccos), they also display different types of blossom elements, which differ between these repertoires (compare spandrels of the Natanz mihrab to spandrels of the Turbat-i Jam and the lunette of the Sirjan mihrab). These blossom elements have however all been produced in a specific manner, typical of these repertoires, which is not found on other stuccos of the Ilkhanid period. Some of their surfaces have been left plain and uncarved, others were perforated, and these blossoms display a combination of uncarved and incised surfaces. The described incision approach is specific to these repertoires and visually impacts the stuccos. Further differences between the repertoires concern vegetal scrolls in backgrounds of inscription bands. At Ushturjan, the scrolls comprise large palmette-derived elements. The scrolls of Natanz are visually closer to those of the Kashan area repertoires, with small leaves and large scrolls carved in the central parts of the spandrels. The scrolls at Turbat-i Jam comprise large palmette elements, but those of Sirjan are characterized by diverse types of abstracted blossom elements with incisions on their surfaces. In addition to these, the repertoires comprise further differences. Perhaps the most obvious differences are those of the stuccos on the supporting walls of the Sirjan mausoleum, which feature unique hexagonal compositions and other types of ornamental medallions.⁷¹¹ Moreover, the Ilkhanid mihrab of the Sava Friday mosque (Cat. No. 34) can be associated with the Kirmani stucco repertoires due to its visual and technological similarity to these decorative programmes.

To summarize, stuccos signed by the Kirmani masters were works of distinct but partially interconnected workshops. The relation between these separate workshops impacted the partially shared characteristics of stucco revetment production and design and their visual features. Some of their visual characteristics are unique to these stuccoworks and cannot be compared with other such programmes. The discussed stuccoworks are the ones which survive,

⁷¹¹ Nevertheless, the skill level of their production differs from more complex and elaborate mihrab in the mausoleum.

but originally these Kirmani master stucco craftsmen must have headed production of a more extensive number of stucco repertoires, which were lost as time passed. These stuccos are scattered across an extensive geographical area spanning from the north-eastern to southern and central parts of Iran. They are difficult to connect or relate to the stuccos of these regional groups due to their specific visual and technological features. These repertoires present evidence in favour of the argument proposed by this research: stuccoworks should not be comprehended within frameworks of regional stucco schools or stucco styles. Compared to the Seljuq decorative programmes, Kirmani stuccos display more balanced designs, a greater variety of inscription styles and creativity in their use, and more elaborate vegetal designs.

g.) The Uljaytu Mausoleum at Sultaniyya and the Varamin Friday Mosque Stuccos

Figs. 46-47.

The carved stuccos of the second decorative phase at the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) and stuccos of the Varamin Friday mosque (Cat. No. 28) are difficult to relate to other repertoires due to their specific visual features. These two decorative programmes may be interconnected. This research had shown that most likely, the first decorative phase in glazed and terracotta elements at Sultaniyya was produced by the same craftsmen who produced the revetments in the same medium on the entrance portal and in the interior of the domed hall of the Varamin Friday mosque. There thus exists a possibility that the stucco craftsmen who worked at Varamin arrived there from Sultaniyya. The two repertoires in fact share some characteristics, but they also display considerable divergence.⁷¹²

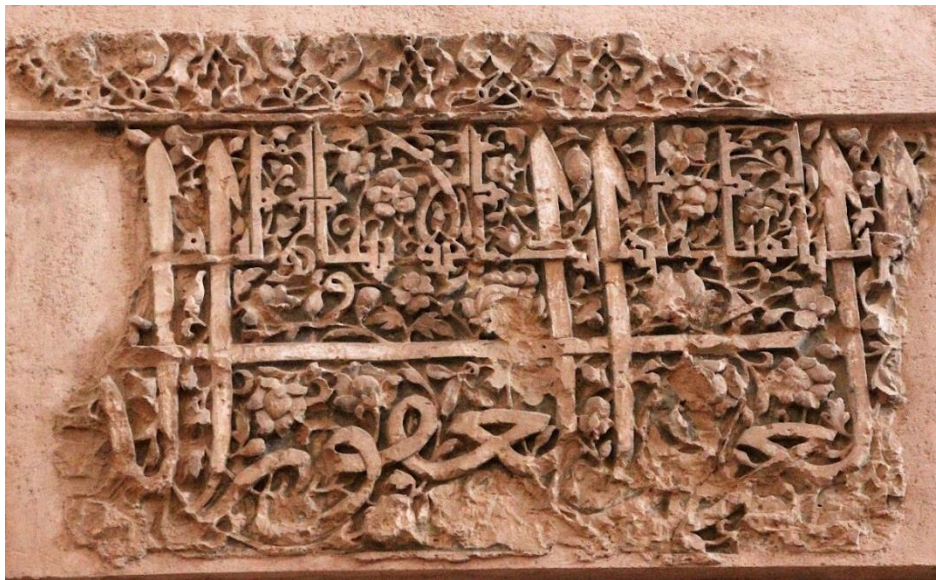


Figure 46: Double monumental inscription band above the dado area of the oratory of the Uljaytu mausoleum at Sultaniyya, second decorative phase (c.1316/20).

Carved stuccos of the Uljaytu mausoleum are located in two areas; as part of the revetments on the eastern façade, now on the monument's exterior and in the mausoleum's oratory, where they form its monumental dado area inscription frieze. Further fragments of carved stuccos discovered at the site indicate that, originally, the monument featured a more extensive carved

⁷¹² This could be the result of technological and stylistic developments of the stucco production of the workshop at the time, which passed between the works at Sultaniyya and those at Varamin.

stucco programme. The stuccos of the opening passage and those of the oratory differ considerably in terms of their production technology and aesthetics, and they are somewhat less likely to have been works of the same workshop. Stuccos of the eastern façade display a peculiar production method and a distinct visual style unique to the context of Ilkhanid stuccos. These stuccos were produced with a selection of artistic techniques, which comprised carving of stuccos out of one or more layers, formation of applied protruding elements in abstracted vegetal forms and slightly undercut stuccos. Their distinguishing stylistic characteristics comprise arabesque bands of whirling abstracted leaf elements and symmetrically composed panels of leaf and palmette elements inserted into framing devices of arches. Stucco perforation is absent and the entire stucco relief is relatively shallow. The inscription panels are especially low relief. The stuccos in the oratory are entirely different. They were produced by carving several stucco layers and form deeply carved reliefs, which were visible at the inscription band topping the dadoes. The band comprises two inscription styles (Kufic and *Thuluth*) and it displays an elaborate floral scroll with blossoms resembling peonies and other plants. The manneristic approach to design, ornamentation and carving of these stucco reliefs is similar to the stuccos of the Varamin Friday mosque. Moreover, the two repertoires also share the use of two inscription bands of differing dimensions and styles in stucco inscriptions (compared to the monumental framing band of the Varamin Friday mosque's mihrab).

In sum, stuccos of the opening passage and the oratory at the mausoleum of Sultaniyya, display technical and visual characteristics, which are not shared with the other stuccos in the given region. This might indicate that their stucco craftsmen could have been mobilized from a long distance for the purpose of the mausoleum's decoration. The unique aesthetics of these stuccos, especially the ones around the opening passage of the mausoleum (the eastern façade), might have been deliberate and produced by craftsmen in a different manner, due to the high profile of the commission. The closest parallel for the stuccos in the oratory, and partially for those of the opening passage, is the Varamin Friday mosque decorative programme, which also retains glazed revetments produced by craftsmen who worked at Sultaniyya. It is thus plausible that the stuccos of the two monuments could have been produced by the same craftsmen, who migrated together with glazed revetment craftsmen experts to Varamin upon the completion of works at Sultaniyya.

The stuccos of the Varamin Friday mosque are concentrated in the lower portions of the *qibla iwan*'s interior surfaces and especially in the monumental domed prayer hall. The repertoire is extensive and it consists of a monumental (dated 1325) carved inscription band running along top edges of supporting walls, a large mihrab, additional panels of carved stucco flanking the mihrab, and some background revetments on supporting walls and in the side prayer halls. The monument was redecorated in the mid-fifteenth century (as noted by a set of historic inscriptions in the *qibla iwan*), but it is difficult to establish to what extent the original stucco repertoire of the domed hall was modified, except from some panels on mihrab's left hand side.



Figure 47: Detail of the monumental framing inscription band of the carved stucco mihrab at the Varamin Friday mosque featuring some specific features of its stucco repertoire.

The background stucco programme of the mosque's side prayer halls carries a signature of the master stucco craftsman with the *nisba* Qazvini, but it is unlikely that this workshop also produced the stuccos in the domed prayer hall. The stuccos in the domed hall of the mosque are produced with a relatively wide selection of stucco artistic techniques, which comprise: carving of stucco panels mainly out of more than one layer, applied protruding elements of different forms and partial stucco undercut. The mihrab is characterized by the basic design of panel division, but these panels are carved to feature masterly designed inscription bands and dynamic reliefs of stuccos consisting of diverse abstracted vegetal elements. The mihrab features inscriptions in different types of Kufic styles ranging from Knotted Kufic to Plain Kufic. The monumental Knotted Kufic inscription displays the double incised outline, which points towards stucco repertoires of the northern part of central Iran and of the Isfahan area. The mihrab's non-epigraphic panels are of exceptional depth and feature several visual planes. The lunette of the mihrab's interior niche displays a very deep relief and a symmetric composition consisting of: palmettes, split palmettes and other abstracted vegetal elements, comparable to stuccos in the central Iran. A very peculiar element, perhaps unique to the repertoire, is the border of palmettes, which repeats the swastika design, and assumes appearance of a pseudo-Square Kufic band, similar to those of the Isfahan area stuccos.

The mihrab's spandrels feature unique forms of vegetal designs, which are difficult to compare to the other stucco repertoires. Background floral scrolls of the mihrab's monumental inscription band feature complex compositions on differing visual planes, with a predominance of palmette elements with swastika border. The exterior framing panel of the mihrab is of

unique form and it consists of repeating bands of symmetric compositions of abstracted vegetal elements. They are heavily perforated and superimposed to feature stucco undercut and design spread across different visual planes. Occasionally, the swastika borders of palmette elements are substituted by repeating invocations to God in Square Kufic. The mihrab therefore features several unique traits. Compared to the mihrab, the monumental inscription band in the hall displays a more frequently encountered aesthetic of fluid *Naskh* inscription with a regular floral scroll background and occasional protruding elements of diverse abstracted vegetal forms. Floral scrolls assume forms comparable to similar inscription background scrolls of the monuments in Yazd. The stuccos of this monument are different from the monumental dated stucco band running along the dado area in the interior of the core of the Imamzada Yahya in Varamin (Cat. No. 36), which retains features comparable to stucco repertoires of the area between Qum and Isfahan.

In sum, the two discussed stucco repertoires are difficult to compare to stucco programmes in related regions of their location, due to the specific visual elements of these stucco repertoires. The two repertoires might have been produced by craftsmen, perhaps the same workshop, who were mobilized from a more distant location. On the other hand, it is possible that the related stuccoworks comparable to these repertoires are simply no longer extant. These repertoires however share some characteristics of stuccos in the central Iranian region, indicating the possible origin of their craftsmen.

h.) Carved stuccos of Na'in, Yazd and Abarquh (the Baba 'Abdullah complex, the Rukniyya, the Shamsiyya, the Abarquh Friday mosque and the Mausoleum of Sayyid Gul-i Surkhi)

Figs. 48-51.

This research documented several monuments with carved stuccos located in the area stretching between Na'in, Yazd and Abarquh (Cat. Nos. 9, 29, 11). In terms of production technology, visual features and aesthetic appearance, the majority of these stuccos relate to stuccos of the central Iranian territory, and more specifically to stuccos in the Isfahan area. Stuccos in these three listed settlements are related to each other, yet in every settlement the logic behind their use and details of their visual appearance are distinct from each other. The stuccos of the Na'in Baba 'Abdullah complex present the unique case in which they are employed to cover an extensive number of cenotaphs in the mausoleum of the complex. At Yazd, the carved stuccos are almost exclusively employed to cover parts of entrance portals of the mausolea, which originally functioned as focal points of larger, mainly no longer extant, charitable funerary complexes. The two stucco repertoires in the settlement of Abarquh are related to each other to the point that it is possible to propose that they are the work of the same workshop.

The Na'in Baba 'Abdullah Complex Stucco Cenotaphs

The stucco repertoire of the Baba 'Abdullah complex (Cat. No. 9) is a unique case, in which carved stuccos were employed to decorate a series of cenotaphs in the mausoleum of the complex. It is most likely that these cenotaphs were decorated as a single decorative intervention, which might post-date the formation of the group of the graves by some years or decades and which likely dates to the first decades of fourteenth century. The largest of the cenotaphs, decorated in tile mosaic of four colours might be a result of a slightly later decorative

intervention from the late Ilkhanid or Timurid period. The stuccos of these cenotaphs display uniform use of selected stucco artistic techniques and visual features, and they should be considered works of one stucco workshop. They were mainly produced by carving a single stucco layer, and only occasionally do their reliefs display more than one visual plane. The dominant motif of stuccos are diverse repeating geometric patterns, and only two cenotaphs retain symmetric compositions of palmette-derived elements. These geometric patterns comprise diverse types of rosettes, circular elements and geometric webs of triangular and star patterns. Some cenotaphs display inscription fragments which are always expressed in *Naskh* style. The cenotaph stucco panels are rather flat and they do not comprise any protruding elements, stucco undercut or other more complex stucco production devices. Their visual appearance is difficult to compare, because the described phenomenon of stuccoing cenotaphs is without a parallel. These stucco cenotaphs should be considered works of craftsmen of lesser skill of local origin.



Figure 48: Characteristic geometric pattern of a stucco panel on one of the cenotaphs of the Baba ‘Abdullah complex in Na’in (Cat. No. 9).

Rukniyya and Shamsiyya in Yazd and their Carved Stuccos

The mausolea of Sayyid Rukn al-Din and his son Shams al-Din (Cat. No. 29) were originally part of more extensive charitable complexes with multiple functions in Yazd’s city centre. These architectural forms are likely to have been taken over from the area of Tabriz, where reportedly the plan for Shamsiyya was drawn.

The two mausolea of the complexes display specific regional characteristics of revetment programmes, which were produced with a selection of more than one decorative medium

(carved stucco, wall paintings and applied moulded and stencilled stuccos) in which carved stuccos played a limited role. Stuccos were above all employed to decorate interior surfaces of entrance *iwan* portals of domed square mausoleum structures, where they were combined with applied moulded and stencilled stuccos. Interiors of the two mausolea display monumental repertoires produced out of moulded and stencilled stuccos and combined with wall painting techniques. Only at the Rukniyya are parts of its mihrab in moulded and stencilled stuccos also produced with carved stuccos (e.g. the spandrels). Carved stuccos are thus employed in a limited amount and according to a specific logic. These stucco reliefs are characterized by several visual planes and deep carving of their relief and their slight undercut. Visually, they resemble stuccos of the Isfahan region, but their designs are more complex. They feature monumental inscription bands, which run around the interiors of entrance *iwans* and comprise diverse inscription styles of which the larger style is a specific type of Kufic with double incised outline, similar to the manner of stuccos in central Iran.



Figure 49: Fragment of the triple carved stucco inscription band in the entrance *iwan* of the Rukniyya mausoleum (Cat. No. 29).

In addition to these, Rukniyya preserves fragments of monumental vertical rectangular panels of symmetric compositions of palmette and half-palmette elements combined with bands of repeating invocations to God in Square Kufic; they are frequently employed in such compositions on stuccos of monuments in Isfahan and occasionally in northern parts of central Iran (such as the framing monumental tripartite panel of the mihrab in the Varamin Friday mosque). The distinctive feature of these stuccos are their inscriptions, which combine more than one inscription and variegate inscription styles more frequently compared to other Ilkhanid stuccos. This might be connected to specific practices of superimposing inscriptions in diverse

styles characteristic of artistic techniques of moulded and stencilled stuccos found in these monuments, but which requires use of stencils for production of inscriptions. It is accordingly possible to conclude that these stuccos are likely the work of a workshop, which operated in the area and had close ties with other workshops in the Isfahan area and central Iran. These stuccos differ from stuccos in Abarquh which resemble stuccos of the Isfahan area.



Figure 50: Section of a triple inscription band in carved stucco at the entrance *iwan* of the Shamsiyya mausoleum of the complex (Cat. No. 29).

Abarquh Friday mosque and the Mausoleum of Sayyid Gul-i Surkhi and their Stuccos

The stucco mihrab of the Abarquh Friday mosque (dated 1338; Cat. No. 10) is located in its south-eastern *iwan* and it closely resembles the extant fragments of the carved stucco mihrab in the nearby mausoleum of Sayyid Gul-i Surkhi (Cat. No. 11). These two stucco repertoires were produced in a similar manner and they display related visual elements and epigraphic styles. Their aesthetics and style resemble stuccos of Isfahan, rather than those of Yazd or Na'in, despite their greater geographical proximity. This might reflect the possibility that the Abarquh stuccos were produced by a workshop arriving from the Isfahan area.

The mihrab of the Sayyid Gul-i Surkhi is preserved only in fragments. But the remains of its design and technical and visual characteristics of the fragmented mihrab provide evidence arguing that it is work of the same stucco craftsmen's workshop as the Abarquh Friday mosque mihrab. This mihrab was combined with other stucco panels topping it and covering other parts of the interior surfaces of mausoleum's supporting walls. They featured shallow muqarnas and abstracted vegetal elements, but they could have been produced by moulding of stucco mass. Their appearance is rather specific and no parallel has been found for them.

The once monumental carved stucco mihrab of the Abarquh Friday mosque is preserved in a fragmented state; its upper part is no longer extant and reliefs of its numerous panels are considerably damaged. The mihrab is characterized by a very deep internal niche formed by a twisted torus moulding, which does not find parallels in other Ilkhanid stuccos.⁷¹³

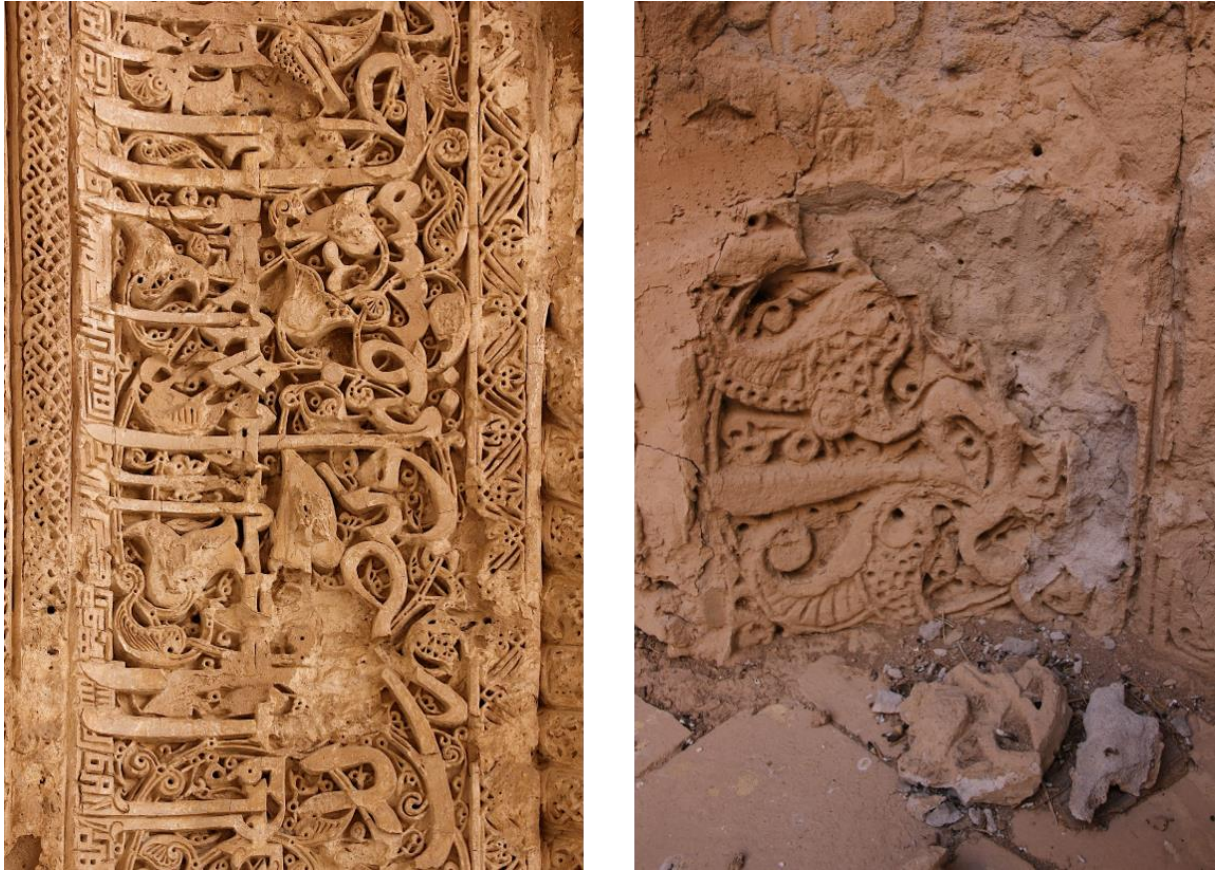


Figure 51: Comparison of stucco inscription bands between the mihrab of the Abarquh Friday mosque (left) and the fragments of the mihrab of the Sayyid Gul-i Surkhi mausoleum in Abarquh (right).

The mihrab's panels were produced with a combination of artistic techniques comprising carving of more than one layer of stucco to form different visual planes of its relief, application of protruding elements of different forms of abstracted vegetal elements, mainly in the background of inscription bands, and heavy perforation of its thin geometric bands and vegetal compositions. The mihrab displays a deeply carved relief with occasional minor protrusions and its visual elements divided into several visual planes, which determined the mihrab's dynamic appearance and added to its design complexity. The lunette of the mihrab's inner niche is well preserved and it features a composition of abstracted vegetal elements with predominant motive of a large half-palmette. The composition and stylistic features of the lunette are related to such panels of stucco repertoires in the Isfahan region and the Kirmani *nisba* signed mihrabs. The lower portion of the niche retains a vertical rectangular panel with a specific composition

⁷¹³ The mihrab is also important for the understanding of Ilkhanid stucco production technology, because it retains evidence of segmented work (*giornata*), indicating that in one segment the craftsmen produced around 80 to 100 cm of a monumental inscription band with a complex design featuring three different inscriptions and elaborate floral background (see Chapter 3; Section 3.1).

comprising Square Kufic inscription and heavy perforation of its background. Similar panels have not been encountered in other stucco mihrabs.

Another peculiar feature of the mihrab is its monumental inscription framing band which features three distinct inscription styles: *Naskh* with elongated *hastae*, Plain Kufic and Square Kufic; they required an expertise of inscription styles. Especially the modality of use of Square Kufic inscription in the band is particular of the mihrab and the closest parallel is the Ilkhanid mihrab of Sava Friday mosque (Cat. No. 34), which however features a much larger and independent Square Kufic inscription. The background of the inscription band is filled with minutely carved floral scrolls of circular form and with numerous visual elements, some of them protruding from the inscription plane of the band's relief. The mihrab also featured two large circular applied protruding bosses in central parts of the spandrels topping its internal niche. The mihrab is additionally framed by a purely vegetal composition band, which adds to its specific appearance. The band is produced by the means of heavy stucco carving, perforation and incision, but it features only one visual plane. The band consists of a repeating symmetric composition of interlacing half-palmettes and abstracted blossom and leaf elements. It should be considered a motive specific to this mihrab.

The overall appearance of the mihrab is manneristic, because it displays a more extensive amount of attention to detail of carving and minute composition compared to the majority of Ilkhanid stucco mihrabs. The visual characteristics of its inscription and geometric and above all vegetal elements, allow the proposition that the mihrab is closely related to stuccos of the Isfahan area and partially to those in the city of Yazd. Its style conforms the most frequently documented aesthetic appearance of stuccoworks of the southern part of central Iran.

Appendix No. 1: Information concerning existing published archaeometric research of pigmentation on stuccos and related revetments.

Monument	Date	Period	White	Yellow	Orange	Red	Green	Blue	Black	Bibliography
Samarra stuccos	9 th c.	‘Abbasid	gypsum, lead white	orpiment, pararealgar	realgar	hematite, red lead, vermillion, ferrous oxide		indigo, azurite	carbon	Burgio <i>et al</i> 2006.
Nishapur stuccos	9-11 th c.	Early Islamic	calcite, gypsum,	limonite, pyromorphite, jarosite	wulfenite, Phoenicochroite	vermillion, red lead, hematite,	atacamite		carbon	Holakooei <i>et al</i> 2018.
Isfahan Friday mosque wall paintings	unknown	Pre-Seljuq	gypsum			vermillion, ferrous oxides		lapis lazuli		Jung <i>et al</i> 2016.
Mount Sofeh fortress wall paintings	11-12 th c.	Seljuq	gypsum	orpiment		vermillion, red lead, madder red	atacamite	azurite	carbon	Holakooei <i>et al</i> 2020.
Pir-i Hamza Sabzpush mausoleum stuccos	12 th c.	Seljuq	huntite			red lead, hematite	atacamite	azurite		Karimy and Holakooei 2015.
Ilkhanid wall paintings Yazd	14 th c.	Ilkhanid	gypsum			ferrous oxides, red lead	malachite	azurite, lapis lazuli	carbon	Boroujeni <i>et al</i> 2013.
Uljaytu mihrab	1310	Ilkhanid	gypsum			ferrous oxides, hematite	malachite	azurite	carbon	Isfahani <i>et al</i> 2010.
Pir-i Bakran mausoleum stuccos	1303 - 1313	Ilkhanid	huntite	ferrous oxides		ferrous oxides		azurite		Holakooei 2007; Aslani 2014, 139-142.
Kashan Friday mosque carved stucco mihrab	14 th c.?	Seljuq or early Ilkhanid?				red lead		azurite, lapis lazuli		Younessi <i>et al</i> 2017.
Alhambra stuccos	14 th c.	Nasrid	gypsum			red lead, vermillion, ferrous oxides	malachite	azurite, lapis lazuli	carbon	Blasco-Lopez <i>et al</i> 2016.

Appendix No. 2: Information concerning the appearance of Qur'anic excerpts in carved stucco medium, Ilkhanid period, for every analysed monument.

Monument	Historic Inscription	Persian Inscription	Hadith	Invocation	Shahada	Blessings	Signature	Surat al-Fatiha (1)	Surat al-Baqara (2)	Ayat al-Kursi (2:255)	Surah Ali 'Imran (3)	Surat al-Nisa' (4)	Surat al-Ma'ida (5)	Surat al-An'am (6)	Surat al-A'raf (7)	Surah Yunus (10)	Surah Hud (11)	Surat al-Tawba (9)	Surat al-Nakhl (16)	Surat al-Isra' (17)	Surah Maryam (19)	Surah Taha (20)	Surat al-Hajj (22)	Surat al-Mu'minun (23)
Uljaytu mihrab	1		2	2	S h i i		1					5 9												
Small mihrab				6				1- 7																
<i>Shah nishin</i>																								
Pir-i Bakran	4			4	S u n n i	1	1	1- 7	2 5 5- 2 5 6	1														
Haftshuya					S u n n i	1		1- 7	2 5 5 5	1	1 7- 1 8													
Ushturjan	2			4		1		1- 6	2 5 5 5	1	1 6							9- 2 2						
Farfan	1			3	1				2 3 8, 2 1- 2 2														7 7	1- 3
Zavara	3										1 6, 1 7				2 9					7 8- 8 1				
Gar	2								2 5 5- 2 5 6	1							7 3							
Kuhpaya																								
Baba Abdullah Na'in	1								2 5 5	1														
Abarquh Friday mosque	1			3																7 8- 8 0				
'Abd al-Samad complex	1						2				1 6 8- 1 7 0							1 8						
Mahallat-i Bala	1			2			1																	
Baba Afzal Maraq				2																7 8				
Kashan Friday mosque											2 6			9 5- 9 6										
Qamsar Miyandih											1 8									7 8				

Nushabad ‘Ali mosque				1	S u n n i					1 8						1 1 4						
Gunbad-i Sabz																						
Imamzada ‘Imad al-Din	1									1 7- 1 8												1- 8
Imamzada ‘Ali ibn Abi al-Ma‘ali	1					2												8 0				
Farumad Friday mosque	1	1	1 0	1 0	S u n n i	4	1- 5		1					3 2, 3 6- 3 7, 5 8- 5 9					1 1- 1 3	3 3	7 7	
Bistam Friday mosque	2			1												1 1 4	1 8- 1 9					
Kashana tower	2					3																
Bayazid Bistami complex	1			3		3	2 5 5	3								1 1 4- 1 1 5	1 8- 1 9		7 8- 7 9			
Jawin Friday mosque	1			2			1 3 6								1 0 5- 1 0 6			1 2 8	7 8- 8 0			
Qala-yi Naw	1 ?	1 or 2	1																			
Marand	2			3		1											1 8, 6 2- 6 3					
Urumiya	2					1	2 5 5- 2 5 6		1 8- 1 9													1- 1 3
Tabriz				1																		1- 7
Pir Husayn Khanqah	1																1 8					
Alinja Khanqah				3						1 8												
Sultaniyya mausoleum	1		2				2 5 5- 2 5 6	1											7 8- 8 0			
Varamin Friday mosque	1					1												8 0				
Turbat-i Jam	1			2	S u n n i	2	2 5 5	1	2 6- 2 8					6 2- 6 4		1 8- 1 9						
Kucha-yi Mir mosque	1		1	1		1	1- 7									1 1 4- 1						1- 5

																	1 5								
Imamzada Rabi'a Khatun	1		1				1	1- 7																	
Mir Zabir mausoleum			1						2 5 5	1										7 7- 7 9					
Sava Friday mosque									1 2 5- 1 2 6																
Sujas Friday mosque									2 8 5- 2 8 9, 2 5 6																
Imamzada Yahya Varamin																									
Khizr mausoleum		2	2					1- 7																	
Gudzar mausoleum	1			3				1- 7					5 4- 6 1							7 8- 8 0					1- 6
TOTAL (out of 320)	3 8	5	2 0	6 0	7	3	2 4	9	1 6	1 2	1 1	1	1	1	4	4	5	8	1	1 2	1	1	1	2	6

Monument	Surat al-Nur (24)	Surat al-Ahzab (33)	Surah Ya-sin (36)	Surat al-Chafir (40)	Surat al-Fath (48)	Surat al-Najm (53)	Surat al-Rahman (55)	Surat al-Hashr (59)	Surat al-Saff (61)	Surat al-Jum'a (62)	Surat al-Mulk (67)	Surat al-Qalam (68)	Surat al-Jinn (72)	Surat al-Qiyama (75)	Surat al-Insan (76)	Surat al-Naba' (78)	Surat al-A'la (87)	Surat al-Dhuha (93)	Surat al-Qadr (97)	Surat al-Ma'un (107)	Surat al-Nasr (110)	Surat al-Ikhlās (112)
Uljaytu mihrab																						
Small mihrab																						
Shah nishin	3 6- 3 8																					
Pir-i Bakran			1- 7						1 3							1- 8						1- 4
Haftshuya												5 1- 5 2										
Ushturjan		5 6	1- 9		1- 6			2 3- 2 4					1 8		1- 4							
Farfan					1- 4																	
Zavara																						
Gar											1- 3											
Kuhpayā																						1- 4
Baba Abdullah Na'in																						
Abarquh Friday mosque					1- 3																	3
'Abd al-Samad complex																						
Mahallat-i Bala					1- 2																	1- 4
Baba Afzal Maraq																						
Kashan Friday mosque										9												
Qamsar Miyandih																						
Nushabad 'Ali mosque																						
Gunbad-i Sabz							y es	2 2- 2 4											y es			
Imamzada 'Imad al-Din			1- 4 5												1- 6							
Imamzada 'Ali ibn Abi al-Ma'ali					y es										y es				y es			
Farumad Friday mosque					1 6, 1 6- 2 5					9- 1 0	1- 1 6, 1 7- 2 8			1- 1 2, 1 5- 3 4, 3 6			1- 1 5	1- 1 1	1- 5		1- 3	1- 4
Bistam Friday mosque					1- 4					9- 1 0												
Kashana tower					1- 7																	
Bayazid					1- 6								1 8									

Bistami complex																						
Jawin Friday mosque								21														
Qala-yi Naw								y es														
Marand																						
Urumiya					1-6																	
Tabriz																						
Pir Husayn Khanqah																						
Alinja Khanqah				16																	1-4	
Sultaniyya mausoleum									y es				y es									
Varamin Friday mosque					2-4				1-7, 9-10			18-19							1-7		1-4	
Turbat-i Jam			6-49		1-6, 1-4							18-23			1-17						1	
Kucha-yi Mir mosque																						
Imamzada Rabi'a Khatun																					1-4	
Mir Zabir mausoleum					1-4																1-4	
Sava Friday mosque			9-15		2-3																	
Sujas Friday mosque		56	7-12			12-16		22-24													1-4	
Imamzada Yahya Varamin									1-4													
Khizr mausoleum																						
Gudzar mausoleum																					1-4	
TOTAL (out of 320)	1	2	6	1	16	1	1	5	1	6	3	1	4	4	4	1	1	1	3	1	2	12

Chapter Four: Ilkhanid Monuments and their Stucco Revetments: their Patrons, Architects and Craftsmen

Introduction

This chapter discusses aspects of patronage of Ilkhanid monuments and carved stucco revetment repertoires. It provides information concerning the identity of the Ilkhanid patrons, their social status and ties to the Ilkhanid Empire. It proposes questions on the relationship between the monument dimensions and functions, and the status of their patrons. It attempts to discern whether the geographical and chronological distribution of carved stuccos could be connected to patterns of patronage. The chapter continues by debating the identity of craftsmen and architects by building on the evidence from the monument inscriptions. The next section examines the intellectual process behind the conception and production of stucco repertoires, from the points of view of the patron, the overseer and the craftsmen. It enables a hypotheses to be put forward leading to a better comprehension of the meaning and function of stuccos addressed in further details in the next chapters. The last section concerns the question of stucco regional schools. It debates the finds regarding the identity and mobility of stucco craftsmen and whether schools of stucco craftsmanship existed in Ilkhanid Iran. It illustrates that the concept of a regional school can only be employed to a very limited extent and only in exceptional cases, rather than as a rule. It suggests alternative ways of comprehension of stucco craftsmen's workshops, as mobile on long and short distances and as independent units, and affiliated with larger groups of artisans.

4.1 Ilkhanid Monuments and Stucco Revetment Repertoire Patrons

Patronage of Ilkhanid Monuments and their Stucco Repertoires – the quantitative Information

a.) Chronology of Ilkhanid Monument Patronage

Fig. 52.

Patronage of monuments in the chronological context (see Chapter 4, Section 4.1) has been divided into four groups: Proto Ilkhanid monuments (1221-1256), Early Ilkhanid monuments (1256-1295), Monuments of the Golden Ilkhanid period (1295-1316) and Late Ilkhanid monuments (1316-1335 and later). Traditionally, scholars considered the reigns of Ghazan Khan (r. 1295-1304) and of Sultan Uljaytu (r. 1304-1316), here labelled as the monuments of the Golden Ilkhanid period (1295-1316), as the period during which construction and decoration of monuments flourished and reached its peak. According to Brambilla, the administrative reforms of Ghazan Khan, which also impacted the construction sector, allowed for the accumulation of wealth within the Empire, which enabled the patronage of monuments to flourish.⁷¹⁴ It has also been sustained that this accumulation of wealth reflected itself fully during the reign of Sultan Uljaytu, when monument patronage reached its apogee.⁷¹⁵ The submitted research on the monuments and the quantitative analysis of the data concerning the time of their patronage and the time of the production of the carved stuccos revises these assumptions. It however relies on existing monuments and the fact that numerous monuments have been lost needs to be taken into consideration. The proposed information is thus of hypothetical nature and not conclusive.

⁷¹⁴ Brambilla 2012, 1, 4; Brambilla 2019, 130.

⁷¹⁵ Brambilla 2012, 1, 4; Brambilla 2019, 130.

Research of the Ilkhanid monuments with carved stuccos provides the following information regarding the chronological context of their patronage. No monuments with stuccos have been documented for the Proto Ilkhanid period (0%), indicating that in the formative period of Ilkhanid architecture, patronage of stucco repertoires must have taken place only on a minor scale. The monumental lustre mihrab from the Islamic Art Museum Berlin, dated 1226, (Inv. No. 5366)⁷¹⁶ is one of the best examples of Ilkhanid architectural revetments, illustrating that monuments continued to be constructed and decorated in the period following the Mongol conquest of the Iranian territory; the rupture between the Seljuq and Ilkhanid periods of monument patronage was thus likely minimal.⁷¹⁷

Quantitative data also illustrates that nine monuments (18 %) were constructed or decorated with stucco in the Early Ilkhanid period (1256-1295).⁷¹⁸ This data indicates that the patronage of Ilkhanid carved stucco took off in at least the Early Ilkhanid period, although it is likely that earlier Ilkhanid examples also exist, but which cannot be precisely dated to the given chronological frame. There had to be a minimum continuity between the Seljuq and Ilkhanid stucco production activities for the long-standing tradition of stucco art knowledge to be transferred from generation to generation of craftsmen. Importantly, the few documented examples demonstrate that stucco production proliferation was not explicitly tied to the Golden period of Ilkhanid architecture and that the trend of decorating the monuments with carved stucco was inherited from earlier patrons and craftsmen. Patronage and production of stuccos was therefore not related to the official religion of the Empire and it was practiced before Ghazan's conversion to Islam in 1295. These Early Ilkhanid activities of monument and stucco patronage should perhaps be understood as pragmatic acts of patronage for the faithful and local population of the Empire's territory. In this manner, patrons of monuments and their revetments asserted their local authority by demonstrating their piousness through monument patronage.

For the Golden Ilkhanid period (1295-1316) the documentation of monuments illustrates that 44 % (twenty-two) monuments were decorated with stucco in this timespan.⁷¹⁹ This data indicates that only less than a half of the monuments was decorated with stucco in the period which is considered to be the apex of flourishing of Ilkhanid art and architecture. This means that less than a half of all the monuments and less than a half of the stucco repertoires were sponsored in the period of Ghazan's and Uljaytu's reigns. It is therefore necessary to reconsider the understanding of the chronology of monument patronage and to highlight that, although important, the period of these two rulers' reigns was not the only moment in the history of the Ilkhanid Empire when stuccos were produced.

This research also documents nineteen monuments (38 %) which were decorated with stucco in the Late Ilkhanid period (1316-1335 and later), marked by the reign of Abu Sa'id and the

⁷¹⁶ [http://www.smb-digital.de/eMuseumPlus?service=direct/1/ResultLightboxView/result.t1.collection_lightbox.\\$TspTitleImageLink.link&sp=10&sp=Scollection&sp=SfieldValue&sp=0&sp=0&sp=3&sp=Slightbox_3x4&sp=0&sp=Sdetail&sp=0&sp=F&sp=T&sp=2](http://www.smb-digital.de/eMuseumPlus?service=direct/1/ResultLightboxView/result.t1.collection_lightbox.$TspTitleImageLink.link&sp=10&sp=Scollection&sp=SfieldValue&sp=0&sp=0&sp=3&sp=Slightbox_3x4&sp=0&sp=Sdetail&sp=0&sp=F&sp=T&sp=2) (Last Accessed: March 3, 2021).

⁷¹⁷ Further monuments, which do not boast carved stuccos, but were either built or redecorated in the Proto Ilkhanid period comprise: the *Imamzada* 'Abdullah in Shushtar, foundation of the Pir Husayn Khanqah in Qubalibalaoglan (Cat. No. 25), the Masjid-i Sang near Darab, the first interventions on the Bayazid Bistami complex in Bistam (Cat. No. 19), and interventions on the Bonaft Friday mosque. From the database of the author.

⁷¹⁸ These are nine out of a total of twenty-two documented monuments pertaining to this period. From the database of the author.

⁷¹⁹ In this period a total of fifty-two (out of hundred and twenty) monuments was either built or redecorated. Accordingly, around one third of the monuments was decorated with carved stuccos, which reflects the popularity of the decorative medium. From the database of the author.

period of disintegration of the Ilkhanid Empire.⁷²⁰ This is an important piece of information because it demonstrates that the patronage of monuments and stucco repertoires did not decline immediately after the end of the Ilkhanid rule. Patrons continued to build and decorate monuments during the period of the weakening of Ilkhanid power and in the time of fragmentation and disintegration of the Empire. Political stability was perhaps not necessary for the monument patronage activities. In fact, it is likely that patronage of monuments increased as a result of the fragmentation of the Ilkhanid Empire, because the new local rulers aimed to establish and assert their political power through monument patronage.

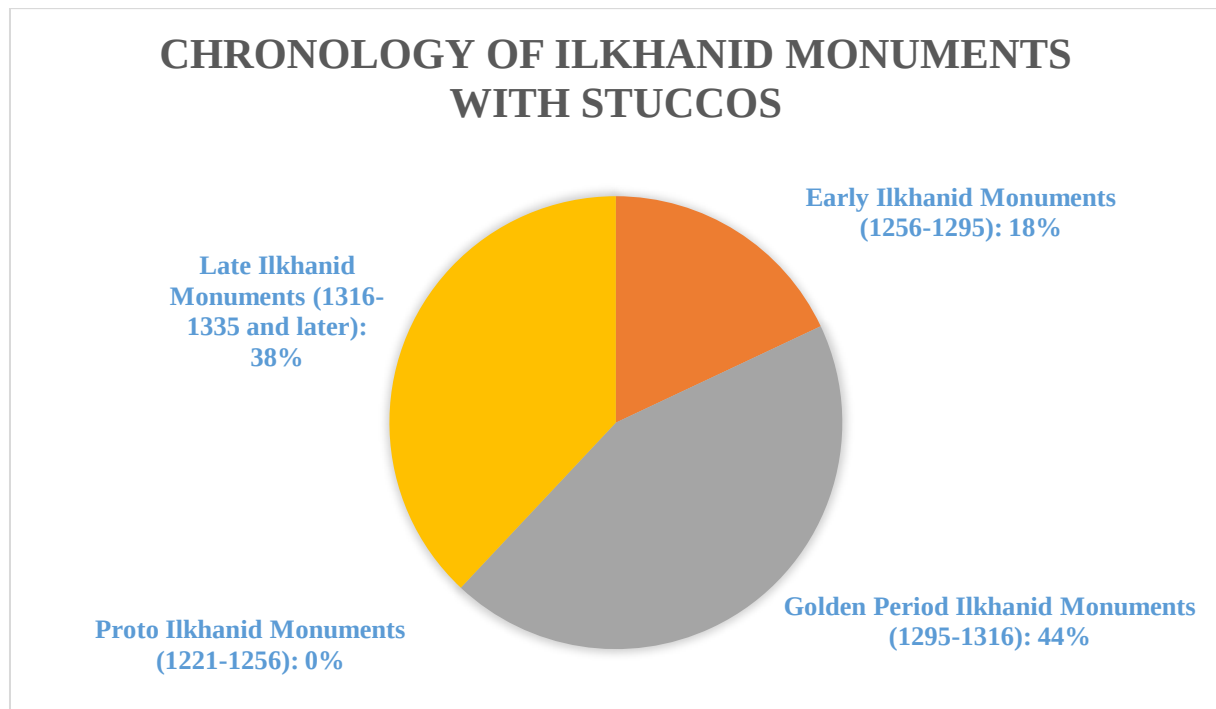


Figure 52: Data concerning the chronology of stucco-related monument construction and decoration during the Ilkhanid period.

b.) Frequency of Occurrence of Ilkhanid Stuccos According to Function of Monuments

Fig. 53.

The documentation and discussion of the monuments enables the debate of the relationship between stucco repertoires and their occurrence in monuments with differing functions. Quantitative analysis includes fifty monuments, out of a total of one hundred and twenty Ilkhanid monuments or redecoration interventions on earlier structures. It demonstrates that carved stucco was most frequently employed in congregational mosques (37 % of repertoires / 18 repertoires). In addition to congregational mosques, stuccos were frequently employed for the decoration of pilgrimage complexes (11 cases / 22,4 %) and mausolea (7 cases / 14 %).⁷²¹ Stuccos were employed on a minor scale for the decoration of residential mosques (four cases / 8,2 %), funerary complexes (four cases / 8,2 %), *imamzadas* (four cases / 8,2 %) and in one

⁷²⁰ In this period, a total of seventy-one monuments were either built or redecorated. This is considerably more, compared to fifty-two of the Golden period. From author's database.

⁷²¹ Not all the mausolea from the area of Qum (Cat. No. 15) have been included into this study: only the three mausolea of Bagh-i Sabz were included. These monuments nevertheless display a regional phenomenon tied to the area of Qum and they are not representative of the entire Iranian territory.

case for a funerary tower (2 %; Burj-i Kashana, Cat. No. 18). In addition to these, some stuccos were documented at the early Ilkhanid summer palace of Takht-i Sulayman.⁷²²

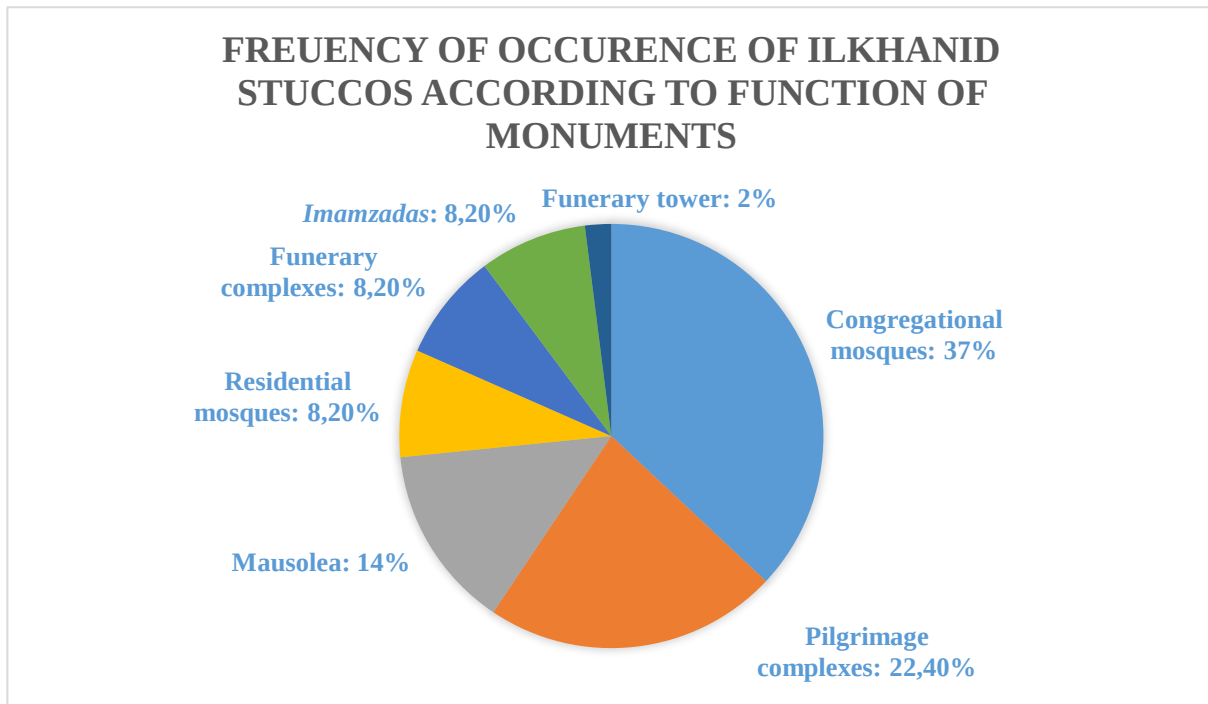


Figure 53: Frequency of occurrence of carved Ilkhanid stucco repertoires in monuments according to their primary function.

The listed data demonstrates that around half of all the stucco repertoires were produced to decorate surfaces of congregational mosques and pilgrimage complexes. Use of stuccos was less frequent for decoration of minor or medium dimension mausolea, residential mosques, funerary complexes and *imamzadas*. This difference may indicate that stuccos were employed above all for architectural repertoires of public religious monuments and that they were aimed at the congregational communities. This may be due to congregational mosques and pilgrimage complexes being structures which attracted continuous patronage, as determined by their religious function. These monuments were therefore more frequently renovated, repaired and redecorated, through the centuries and under different dynasties. On the other hand, smaller mausolea, *imamzadas*, and residential mosques, were monuments which attracted lesser attention of patrons and they were less frequently redecorated. Another significant difference between these types of monuments is their dimension, with *imamzadas*, mausolea, funerary complexes and residential mosques frequently assuming more restricted dimensions, compared to pilgrimage complexes and congregational mosques. It is accordingly likely that stucco was often employed for congregational mosques and pilgrimage complexes also due to how easy it was to cover large scale surfaces with this. Carved stucco was also technologically suitable for redecoration interventions on already existing monuments.

⁷²² It is not clear if they were parts of a secular or religious structure. It is perhaps more likely that they were part of the extensive decorative repertoire of the palace, rather than a small dimension mosque. Further research would be necessary to better comprehend the original architectural context and function of these stuccos, which are beyond the feasibility of this research work. There is however ongoing parallel research by the DAI.

c.) Identity and Status of Stucco Repertoire Patrons and Patterns of Patronage

Fig. 54.

The research of the monuments (presented in the Catalogue of Monuments) attempts to provide as much information as possible regarding the patrons of monuments and stucco repertoires. Information concerning patronage is most frequently contained in the historic inscriptions of the monuments; occasionally, the patron can be discerned based on the research of primary and secondary literature. Patronage information is nevertheless rather scarce, compared to the greater amount of information concerning stucco craftsmen. The identity of some 28 (56 %) patrons of stucco repertoires could not be directly discerned, but the research of the monuments allowed to hypothesize regarding the patrons' status (see Appendix to the Chapter, No. 3). Among the identified patrons, the largest group (9 cases, 18 %) comprises Ilkhanid officials of diverse ranks. It is followed by other local rulers or ministers of local dynasties (7 cases, 14 %). Four cases of patronage (8 %) have been discerned as performed by Ilkhanid rulers and in two cases (4 %) patronage was enacted by Ilkhanid ministers. Smaller monuments in remote locations or in smaller settlements may have been sponsored by local religious or political authorities, but no primary or secondary evidence has been discerned that could confirm this assumption.

Discerned evidence concerning the patronage of monuments by Ilkhanid rulers is important, compared to the preceding Seljuq period, for which there is no evidenced patronage of congregational mosques by Seljuq rulers.⁷²³ Another important example of imperial patronage of a secular complex, from the Early Ilkhanid period, which has not been included in this study but requires a mention, is the construction of the Ilkhanid summer palace at Takht-i Sulayman by Abaqa Khan in 1270s. This imperial commission resulted in the production of a rich architectural repertoire for the palace, which above all consisted of tile revetments produced with a wide variety of artistic techniques.⁷²⁴ It is also significant to mention that the Ilkhanid capital of Sultaniyya was first founded by Abaqa Khan, during whose reign the first construction activities at Sultaniyya took place. Patronage of Sultaniyya was continued above all by Sultan Uljaytu, who also sponsored construction of his mausoleum within the citadel (see Cat. No. 27). Further important imperial commissions comprise Ghazan Khan's sponsorship of Ghazaniyya at Tabriz which comprised his mausoleum.⁷²⁵ These patronage activities comprised the formation of complexes and settlements. Imperial patrons attempted to determine urbanistic developments of the settlements which retained the status of Ilkhanid capitals. This specific type of patronage was continued by later dynasties, such as the Muzaffarids of Yazd, where the Muzaffarid ministers sponsored the construction of multi-functional charitable complexes (see Cat. No. 29), which retained functions significant for the infrastructure of their capital. Other types of Ilkhanid imperial patronage comprise activities in Bistam, which are related to enlargements and the rebuilding of the Bayazid Bistami complex (Cat. No. 19) by Ghazan Khan and Sultan Uljaytu, the construction of the Kashana tower (Cat. No. 18) by Uljaytu and perhaps activities related to the rebuilding of the Bistam Friday mosque (Cat. No. 18). Some of these activities were performed by the future rulers of the Ilkhanid Empire. Patronage tied to the

⁷²³ There however exists evidence of some Seljuq sultans founding madrasas in Isfahan and Hamadan. Moreover, the Seljuq ruler Malikshah founded the Sultani mosque in Baghdad. I thank Lorenz Korn for this information. Lorenz Korn, personal communication to the author.

⁷²⁴ For the most up to date study of the revetment repertoire see Masuya 1997. See also Masuya 2019.

⁷²⁵ In addition to Ghazaniyya, another significant complex-settlement in Tabriz was the Rashidiyya, founded by the minister Rashid al-Din.

Bayazid Bistami complex assumed a distinct scale and significance, compared to the patronage of Takht-i Sulayman, Ghazaniyya and Sultaniyya. It might have been of a more esoteric nature, perhaps tied to the beliefs of Ghazan Khan and Sultan Uljaytu. Equally, the patronage of the Bistami complex was also of political significance for the two rulers, who illustrated their piousness and authority by the means of sponsorship of the pilgrimage complex. These examples illustrate that the majority of the Ilkhanid rulers were active sponsors of the architectural structures, complexes and even entire settlements.

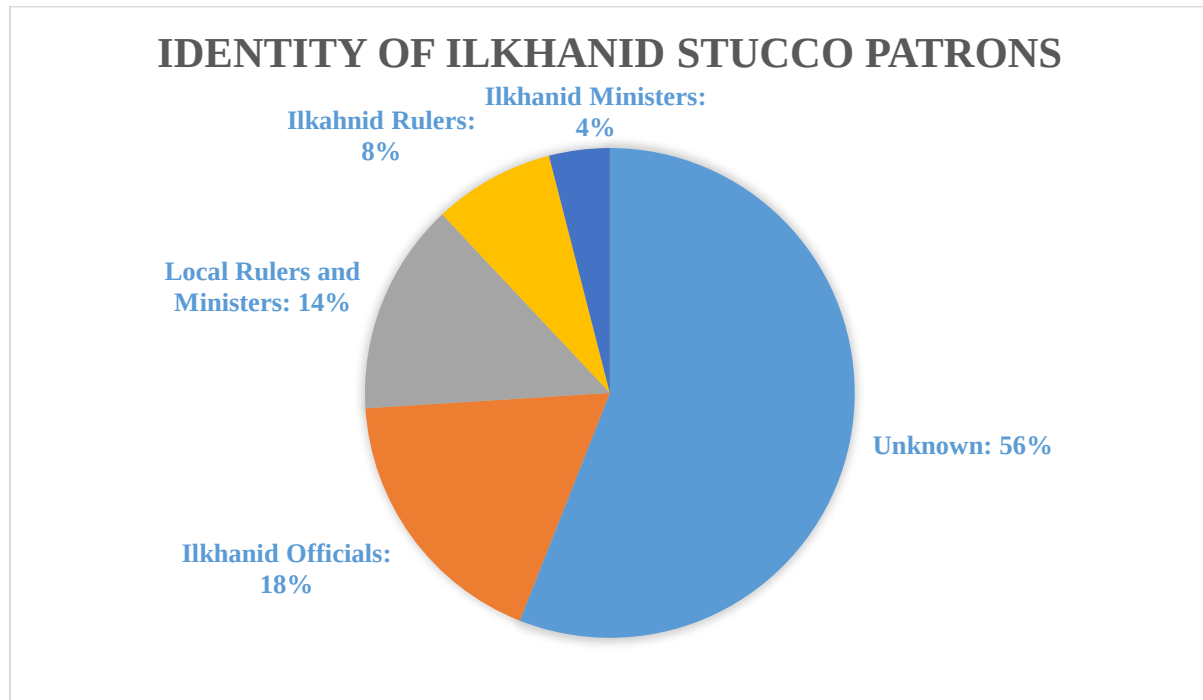


Figure 54: Collected data concerning the identity of the Ilkhanid patrons of monuments with stuccos.

The most extensive group of documented Ilkhanid patrons were the Ilkhanid officials of higher, middle and perhaps lower rank. It is thus plausible that patronage of religious structures could have been sanctioned by the state and by the rulers. The rulers may have given the task of architectural sponsorship to Ilkhanid officials, who could have been obliged to sponsor the upkeep, repairs, enlargements, modifications and foundations of religious monuments across the Empire. On the other hand, the Ilkhanid officials could have themselves decided to sponsor works on monuments, in order to consolidate their political positions.⁷²⁶ Sponsored structures provided the infrastructure which aided the state control of the official religion and the religious practices of minorities. Patronage also fostered pilgrimage activities, which could boost the Empire's economy and increase its integrity through the steady flows of pilgrims via the settled communication routes. Similar patronage patterns can thus be discerned for patronage by the Ilkhanid officials, who aimed to sponsor enlargements and modifications of pilgrimage complexes, such as the 'Abd al-Samad complex at Natanz (Cat. No. 12), the mausolea at Qum (Cat. No. 15), the Bayazid Bistami complex at Bistam (Cat. No. 19), the Pir Husayn Khanqah (Cat. No. 25) and the Imamzada Yahya at Varamin (Cat. No. 36).

⁷²⁶ A perhaps good case of such motivation for patronage could be the sponsorship of the Uljaytu mihrab by the minister Muhammad al-Sawi (see Cat. No. 1).

Information concerning the identity of the Ilkhanid patrons occasionally comprises *nisbas* in their names. This research (see Chapter 4; Sections 4.2, 4.4) indicates that *nisbas* of stucco craftsmen may not be strictly considered as geographical *nisbas*. But in the case of *nisbas* of patrons, some correlations between locations of monuments and their *nisbas* could be discerned.⁷²⁷ The correlation between *nisbas* and names of settlements where the monuments are located is even stronger in the case of the overseers of constructive and decorative activities. Local Ilkhanid officials were in the majority of cases the overseers, as they were familiar with the sites, or they may have been required to oversee the sites near their offices. Some examples below illustrate this proposed hypotheses.

In the case of the Uljaytu mihrab, the patron of the mihrab was Muhammad al-Sawi, an Ilkhanid minister, from the settlement of Sava. He decided to sponsor the mihrab in the Isfahan Friday mosque, due to the significance of the monument and because he worked in the given geographical area; the commission was thus not tied to the origin of the minister. Quite to the contrary, the overseer of the Uljaytu mihrab's installation was 'Ali 'Adud al-Mastari, presumably from Mastar, a settlement close to Natanz, which is not excessively distant from Isfahan. The patron of the rebuilding and redecoration of the Ushturjan Friday mosque in 1315-16 was Muhammad ibn-i Mahmud ibn-i 'Ali al-Ushturjani, likely a native to, or the descendant of the settlement's inhabitants in which the mosque was rebuilt. Information concerning the Ilkhanid patronage of the 'Abd al-Samad complex at Natanz (Cat. No. 12) illustrates that the main patron of the Ilkhanid interventions at the complex, Zayn al-Din 'Ali al-Mastari al-Natanzi, could have been related to the settlement where the shrine was located. Moreover, two out of three known overseers of these interventions (Shams al-Din Muhammad ibn-i 'Ali al-Natanzi and Taj al-Din 'Ali ibn-i Ibrahim al-Natanzi) also retain *nisbas* connected to the settlement. The limited information of the historic inscription at the Bistam Friday mosque (Cat. No. 18) indicates that the patronage of the monument's modifications during the Ilkhanid period could have been enacted by the mosque's *mutawwali*, who resided in the settlement.

Another important patronage case has been documented at the Khanqah of Pir Husayn at Qubalibalaoglan (Cat. No. 25) which was redecorated with a carved stucco mihrab and slightly later with an extensive programme of lustre tiles.⁷²⁸ The monumental lustre tile frieze, which ran along the dado area of the Shaykh's shrine and perhaps in the mosque, comprises a historic inscription highlighting the monument's function, the Shaykh's identity, and the name and titles of the patron who sponsored the decorative programme: 'Umar ibn-i Muhammad al-Shirzadi al-Qazwini, who may have been a state official.⁷²⁹ This important case of use of Kashan lustre tiles for an extensive and prestigious decorative programme of a monument a considerable distance from the tile production centre points towards the significance of the patron's role as provider of revetments and as the person who ordered the tiles in Kashan, to which he could have had specific connections. In the given case, the role of the patron could have been crucial in securing a large number of custom-made tiles for *khanqah*'s redecoration. This evidence might indicate that Ilkhanid officials as patrons of architecture did not only play the role of financial stakeholders, but that they could also play the essential role of communication and

⁷²⁷ Occasionally, those Ilkhanid officials who sponsored work on monuments retain the *nisbas* tied to the settlements where the monuments are located. In other cases, the *nisbas* are entirely unrelated to the settlements where monuments are located, which likely reveals a specific motivation behind their patronage.

⁷²⁸ Some of the tiles might have been re-used from other sites. See Cat. No. 25.

⁷²⁹ This monument is located more than 700 km distance (as the crow flies) from the main tile production centre, Kashan, and the *nisba* of the patron suggests that he could have had family ties to Qazvin, a city 280 km to the north-west (as the crow flies), from Kashan.

decision making concerning the architectural revetments, technical solutions to interventions and provision of material and artisanal working force for monument construction and decoration. But further evidence is necessary to confirm this speculation.

Another important patronage case is presented by the monuments in city of Varamin, which has been highlighted by Blair.⁷³⁰ The patron of the stucco inscription band redecoration in the Imamzada Yahya was the Ilkhanid Malik of Rayy, Fakhr al-Din. The same person sponsored the funerary tower in Varamin, for his father 'Ala' al-Din al-Murtada Fakhr al-Din al-Hasani al-Varamini, from whom he likely inherited his position.⁷³¹ The *nisba* of the father suggests that there were family ties between the patron of the two monuments and the settlement, similar to the mentioned cases of Natanz and Ushturjan. Moreover, the patron of the Varamin Friday mosque, 'Izz al-Din Quhadi, was the protégé of Fakhr al-Din.⁷³² These ties between patrons therefore illustrate how the networks of patronage⁷³³ could be built and how a prominent patron's influence could go beyond the monuments with historic inscriptions mentioning his name. For the Ilkhanid stuccos, there are very few cases where more than one repertoire was proven to have been sponsored by the same patron and the case of Fakhr al-Din's patronage is one of the few examples.⁷³⁴ It is interesting that the two monuments sponsored by the same patron, the 'Ala' al-Din tomb tower and the Imamzada Yahya, are monuments of entirely differing architectural forms and structures with architectural revetment repertoires that are not related in terms of production technology, artistic techniques and decorative media. This therefore indicates that patrons could summon different craftsmen for every commission, rather than constantly collaborated with one group of artisans.

The described mechanism of monument patronage by the Ilkhanid officials, for the purpose of auto legitimization of patrons and in connection to possible state sanctioned monument patronage is presented by the Ilkhanid interventions at the Marand Friday mosque (1330-31; Cat. No. 22). At Marand, the Ilkhanid interventions comprised the installation of a monumental carved stucco mihrab in the main domed prayer hall which dates to the Seljuq period. The mihrab comprises a specific epigraphic programme with two lengthy historic inscriptions which highlight the significance of the mihrab installation patronage. They frame the mihrab's monumental lunette and they thus present the focal points, which would have been viewed by faithful and read by a literate audience. These two inscriptions state that the sponsorship of the renovations was sanctioned by the ruler Abu Sa'id, who provided the funding for the interventions and that the waqf was established by Husayn ibn-i Mahmud ibn-i Taj Khwaja, who was likely in charge of the performance of these renovations. These inscriptions reflect how significant the identity of the patrons and acts of patronage were, and that there was the will to directly communicate them to the faithful who visited the monuments. Patronage was therefore an act of demonstration of pioussness and indication of political power.

Two more examples are significant to better understand Ilkhanid patronage of monuments and carved stuccos: the cases of Turbat-i Jam complex (Cat. No. 30) and the charitable complexes

⁷³⁰ Blair 2016, 6-14.

⁷³¹ *Ibid.*, 11.

⁷³² *Ibid.*, 13-14.

⁷³³ The term "networks of patronage" indicates activities of monument sponsorship by personages who are connected to each other by their family ties and professional positions. These networks could influence choice of builders and craftsmen for monuments sponsored by related patrons. Accordingly, these monuments could feature related architectural solutions and programmes of architectural revetments.

⁷³⁴ This might point towards the fact that many monuments of the Ilkhanid period are no longer extant. Lorenz Korn, personal communication to the author.

of Rukniyya, Shamsiyya and Kamaliyya in Yazd (Cat. No. 29). The patronage of the extraordinary extensive complex of Turbat-i Jam was best discussed by Potter,⁷³⁵ who managed to highlight the significance of the relationship between the political power of the Jami Shaykhs and the rulers of the territories neighbouring Turbat-i Jam. The patronage of the Old mosque of Turbat-i Jam by Malik Ghiyas al-din Muhammad and the sponsorship of the construction and decoration of the Kirmani mosque of the complex by Mu'izz al-Din Kart, the ruler of Herat, were thus acts of political significance, which ensured for the positive political relationship between the pilgrimage complex and the local rulers.

The three examples of Rukniyya, Shamsiyya and Kamaliyya funerary complexes (Cat. No. 29) are significant from several points of view. These monumental charitable complexes with funerary structures with mausolea for their patrons (which comprised major parts of the architectural revetment repertoires) were funded by the ministers of the Muzaffarid rule as charitable foundations in remembrance of the patrons. At the same time, they played a significant role in the infrastructure as learning and charitable centres of Yazd, which consolidated the Muzaffarid rule in the capital of Yazd. Complexes such as the Ghazaniyya and Rashidiyya, and perhaps structures at Sultaniyya might have provided models for the Muzaffarid foundations. As shown, the plan for Shamsiyya was likely drawn in Tabriz, from where the body of the deceased patron was transported in a marble coffin to Yazd and interred in the complex.⁷³⁶ Moreover, the patrons of Rukniyya and Shamsiyya were father and son, which might have determined consolidation of the described patronage attitudes. The described mechanism of transfer, or spread, of new architectural models, might have also included the transfer of builders and craftsmen. For architectural revetments, it seems almost certain that upon the completion of the second decorative stage at the Uljaytu mausoleum in Sultaniyya (around 1316 or 1320; Cat. No. 27) the craftsmen migrated towards Isfahan and Yazd, where they produced revetments in applied moulded and stencilled stuccos. This indicates that patterns of monument patronage in Ilkhanid period might have contributed to, or partially determined, the migration of craftsmen's workshops across the Ilkhanid realm.

d.) Ilkhanid Monument Patronage and Types of Interventions on Monuments

Foundations *Ex Novo* and Redecoration Interventions – Taxonomy of Interventions

Figs. 55-57.

The discussion of the monuments allows the proposition of quantitative information concerning types of interventions which were performed during the Ilkhanid period and sponsored by Ilkhanid patrons. The research revealed that only 50 % (25 cases) of extant Ilkhanid monuments with carved stucco revetments were foundations *ex novo*. The other 50 % (25 cases) were interventions of rebuilding and redecoration, which were founded and constructed in pre-Ilkhanid times. This phenomenon could be understood as stemming from the lack of funds for more extensive commissions and new foundations of monuments. It is however more reasonable to propose that the discerned interventions on earlier monuments reflect the pragmatic approach of the Ilkhanid patrons towards the improvement of the Empire's architectural infrastructure. Instead of funding new structures, patrons preferred to modify existing monuments, the function of which was already established and in use. New monuments were only founded where this was necessary, due to the lack of infrastructure. Furthermore,

⁷³⁵ Potter 1994.

⁷³⁶ Blair 1986a, 33.

interventions on existing monuments included structural repairs less frequently, and patrons sponsored revetments for these monuments to demonstrate and assert their political power through their patronage, on sites which functioned as public spaces and were parts of the collective memory of the communities, as reflected in the written sources.

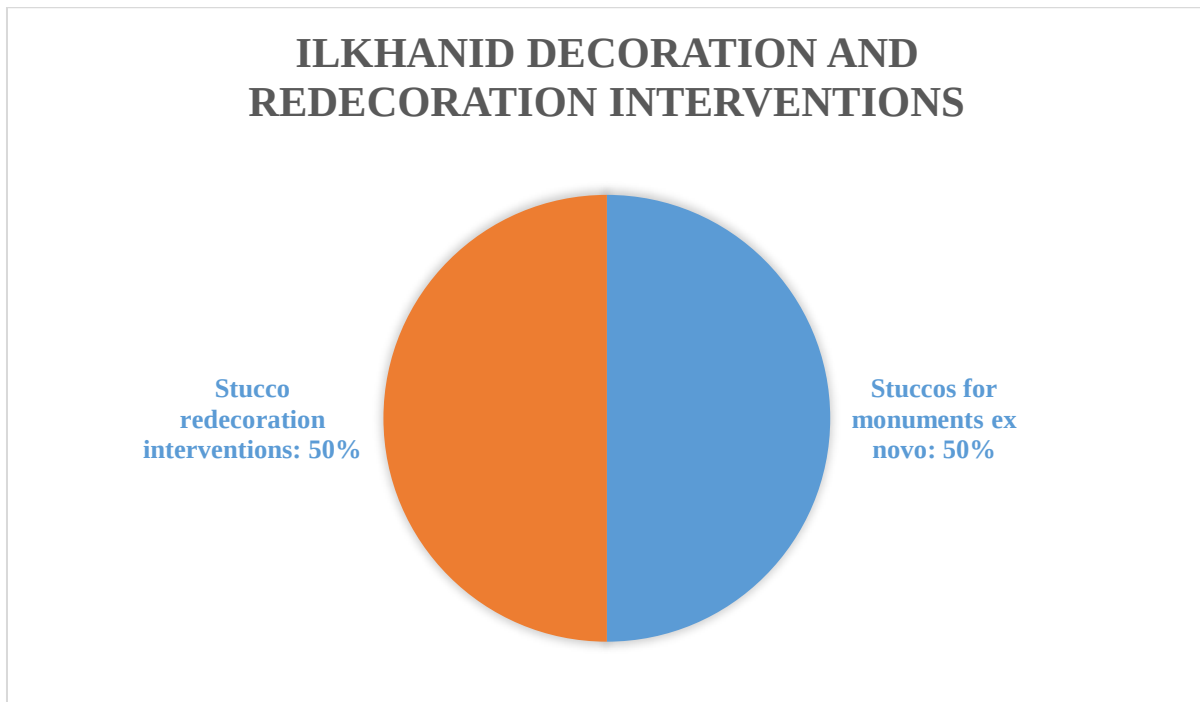


Figure 55: Information regarding the frequency of monument construction and redecoration interventions which comprised production of Ilkhanid carved stucco repertoires.

This analysis showed the difference in the primary function of monuments which were newly founded and their comparison to those which were redecorated or rebuilt. Foundations *ex novo* comprised the construction of funerary complexes, mausolea, *imamzadas* and residential mosques. Only in the case of Varamin, a congregational mosque (Cat. No. 28) seems to have been newly built during the Ilkhanid period.⁷³⁷ In fact, congregational mosques and pilgrimage complexes were structures which were established in pre-Ilkhanid times (in mainly early Islamic or Seljuq periods). This difference of intervention types on monuments according to their function confirms the proposed hypothesis concerning the Ilkhanid patrons' attitude in patronage, based on the needs of the infrastructure of religious public spaces and spaces of collective memory. The Ilkhanids enlarged and redecorated congregational mosques and pilgrimage complexes according to the needs of the communities. New residential mosques were built, perhaps as a result of the growth of population and urbanistic spread of settlements. Moreover, for patrons of such interventions, the act of sponsorship of shrines and pilgrimage complexes enabled them to connect their political power through the pious acts of patronage to the perceived sacred loci, which were already embedded in the collective memory of Empire's population.

⁷³⁷ Further examples are the three incomplete mosques in proximities of Isfahan: the Dashti, Iziran and Kaj congregational mosques.

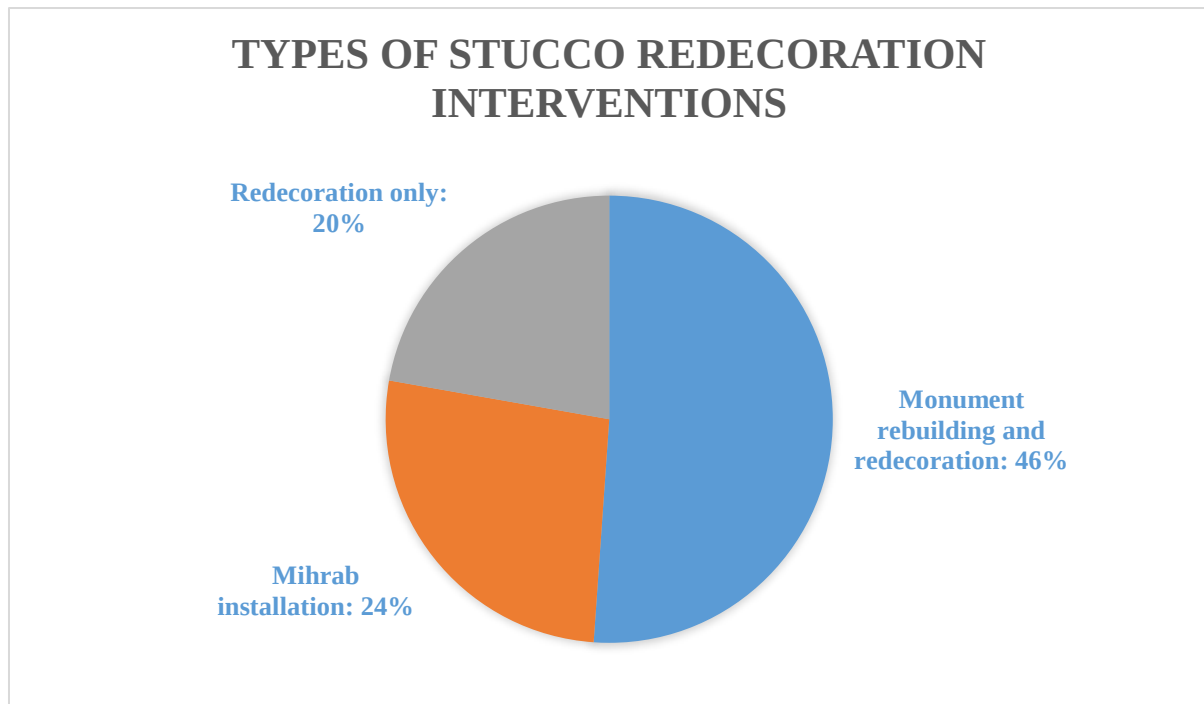


Figure 56: Data regarding the frequency of occurrence of different types of redecoration interventions which comprised production of carved stucco programmes.

This research also provides further indications concerning characteristics of the mentioned (25 cases / 50 % of all interventions comprising production of carved stuccos) Ilkhanid redecoration activities. The most extensive group of interventions (46 %) comprises fourteen cases of monument rebuilding and redecoration. It is followed by six cases (24 %) which consisted of isolated mihrab installation. The third group of five cases (20 %) are the interventions of redecoration of a monument's architectural surfaces which did not include structural modifications. Monument rebuilding and redecoration was performed in six cases in pilgrimage complexes,⁷³⁸ in six cases in congregational mosques,⁷³⁹ in one case in a residential mosque⁷⁴⁰ and in another case at an *imamzada*.⁷⁴¹ Similar to the addressed question of the focus of patrons on existing structures, this data illustrates that patrons mainly sponsored rebuilding and redecoration of pilgrimage complexes and congregational mosques, which constituted the core of the Empire's religious infrastructure. Repairs, rebuilding, additions, redecoration, and other structural modifications of these monuments reflect the will of the patrons and perhaps the needs of communities for larger dimensioned monuments, for the performance of religious rites, and might reflect the trend of population growth.

⁷³⁸ The Pir-i Bakran mausoleum (Cat. No. 2), the 'Abd al-Samad complex (Cat. No. 12), the Bayazid Bistami complex (Cat. No. 19), the Alinja Khanqah (Cat. No. 26), the Turbat-i Jam Old mosque (Cat. No. 30) and the Turbat-i Jam Kirmani mosque (Cat. No. 30).

⁷³⁹ The Haftshuya Friday mosque (Cat. No. 3), the Ussturjan Friday mosque (Cat. No. 4), the Gar Friday mosque (Cat. No. 7), the Kuhpaya Friday mosque (Cat. No. 8), the Farumad Friday mosque (Cat. No. 19), the Khusraw Shir Friday mosque (Cat. No. 17) and the Bistam Friday mosque (Cat. No. 18).

⁷⁴⁰ The Kucha-yi Mir mosque in Natanz (Cat. No. 31).

⁷⁴¹ The Imamzada Yahya in Varamin (Cat. No. 36).

The interventions which consisted of mihrab installation (24 %) were all performed in congregational mosques which pre-date the Ilkhanid period.⁷⁴² These interventions reflect the significance of the mihrab and the importance of its role as the focal point of rites. From the five redecoration interventions on pre-Ilkhanid monuments, which comprised only redecoration interventions (in carved stucco and other revetment media), three were performed in congregational mosques and two in *imamzadas*.⁷⁴³ These interventions comprised production of mihrabs and can be associated with mihrab installation interventions. They reflect the trend of redecorations being performed in the buildings of infrastructural significance.

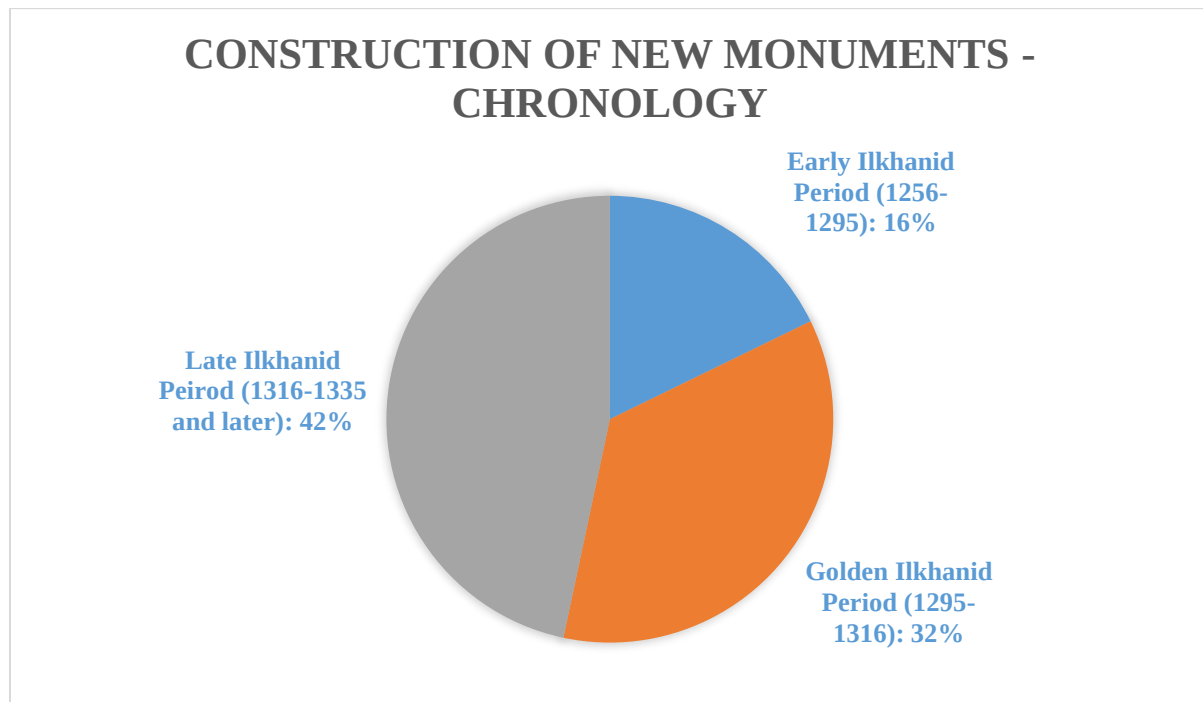


Figure 57: Chronological context of construction of new monuments during the Ilkhanid period.

e.) Foundations and Redecoration Interventions – the Chronological Context

Fig. 58.

Discussion of monuments and the quantitative analysis of patronage trends enable the understanding of the chronological context of monument foundations and redecoration interventions. As mentioned above, of fifty monuments with carved stuccos of the Ilkhanid period, 50 % (25 cases) were foundations of monuments *ex novo* and 50 % (25 cases) were interventions of rebuilding and redecoration, mihrab installation and redecoration. Historic inscriptions and research on the monuments established when these interventions of patronage took place; it is accordingly possible to better understand the chronological context of patronage trends connected to the Ilkhanid monuments with carved stuccos.

The twenty-five cases of monuments funded during the Ilkhanid period were constructed and decorated with stucco in either the Early (1256-1295), Golden (1295-1316) or Late (1316-1335

⁷⁴² Isfahan Friday mosque (Cat. No. 1), Abarquh Friday mosque (Cat. No. 10), Marand Friday mosque (Cat. No. 22), Urumiya Friday mosque (Cat. No. 23), Tabriz Friday mosque (Cat. No. 24), Sava Friday mosque (Cat. No. 34) and Sujas Friday mosque (Cat. No. 35).

⁷⁴³ The Farfan Friday mosque (Cat. No. 5), the Pa Minar mosque at Zavara (Cat. No. 6) and the Imamzada Khizr in Hamadan (Cat. No. 37).

and later) Ilkhanid period. The smallest number of founded monuments was documented for the Early Ilkhanid period, in which 16 % (4 cases) of monuments were built. In the Golden period, 32 % (8 cases) of monuments were built. The highest number of new foundations was recorded for the Late Ilkhanid period, in which 42 % (13 cases) of monuments were founded and decorated with stuccos. The frequency of funding new monuments, as shown in the earlier section, of mainly funerary structures, was low at the beginning of the Ilkhanid Empire, it increased during the reigns of Ghazan and Uljaytu, and it reached its highest frequency in the Late Ilkhanid period. Quantitative analysis reveals different trends for redecorations. For the Early Ilkhanid period, 24 % (6 cases) of monument redecoration have been recorded. The highest frequency of redecoration interventions has been documented for the Golden Ilkhanid period, in which 52 % (14 cases) were registered. Finally, a lesser frequency of redecorations was revealed for the Late Ilkhanid period, when only 24 % (6 cases) of redecorations were documented. Further research is necessary to confirm this.

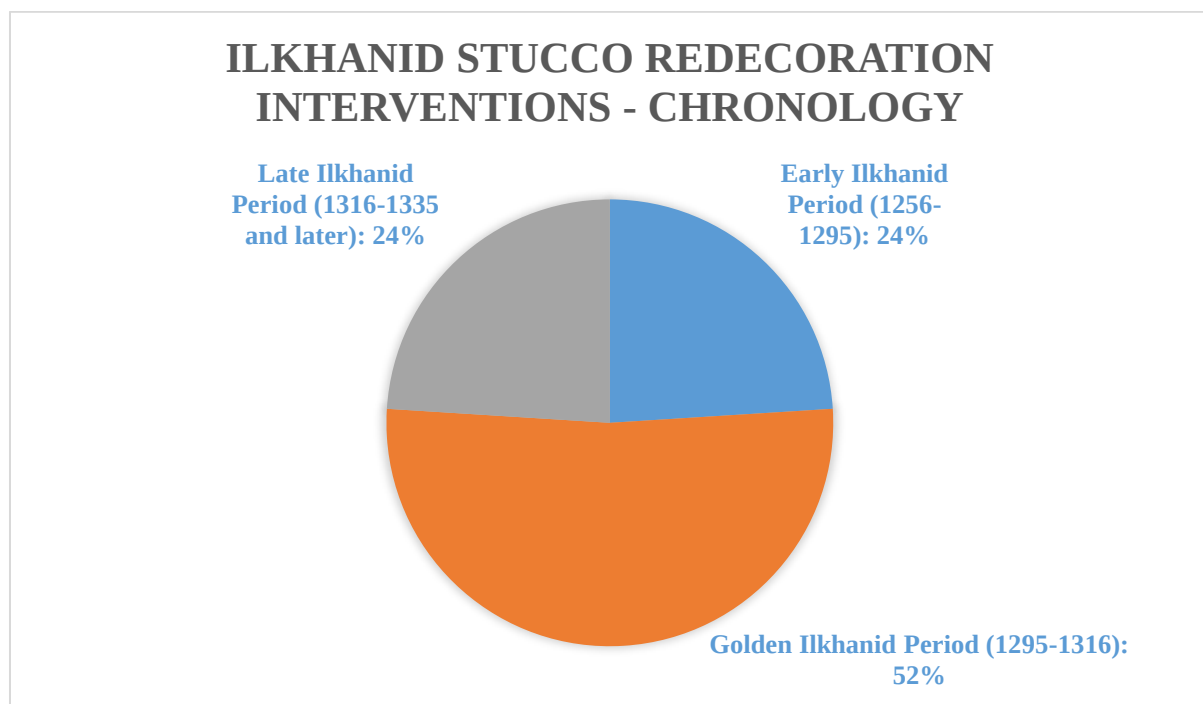


Figure 58: Chronology of occurrence of redecoration interventions with stucco production in Ilkhanid period.

Conclusion

The following conclusions concerning the trends of patronage of new foundations and monument redecorations can be discerned for the Ilkhanid period. Quantitative analysis indicates that there were more redecoration interventions taking place on pre-Ilkhanid monuments in the Early and Golden Ilkhanid periods, compared to foundations of new monuments. This trend reverses in the Late Ilkhanid period in which a considerably higher number of new foundations of monuments has been registered, compared to redecoration interventions.⁷⁴⁴ Several explanations for the described observations concerning trends in monument patronage of the Ilkhans can be proposed. The prevalence of redecoration interventions over new foundations in the Early and Golden Ilkhanid periods might indicate that Ilkhanid patrons first concentrated on maintenance, adjustments, repairs and expansions of

⁷⁴⁴ This is not dissimilar to the patronage of monuments in the late Ottoman period.

existing religious infrastructure necessary for the functioning of the Empire. Moreover, patronage of extant structures allowed them to assert and consolidate their political power through these pious acts.⁷⁴⁵ The trend reverses in the Late Ilkhanid period, when new foundations prevail over redecorations, for two possible reasons. Foundations of new funerary structures by local rulers and authorities were likely results of the fragmentation of the Ilkhanid Empire. In this manner, local rulers asserted their political power and bolstered it by sponsoring charitable funerary complexes and other structures of significant public religious spaces.⁷⁴⁶ This increased number of new foundations can be understood as determined by the wealth accumulated in the Empire, but a closer look at the types of monuments and their geographical locations and identity of patrons, indicates that the former hypothesis (concerning fragmentation of the Empire) is the correct one.

4.2 Ilkhanid Monument and Stucco Revetment Architects and Craftsmen

a.) Signatures of Ilkhanid Architects

There exists limited information concerning Ilkhanid architects and this topic has so far not been discussed by historians of Islamic art and architecture, except for the publication by Mayer.⁷⁴⁷ In his landmark 1956 monograph, Mayer provides a collection of information concerning the signatures and identity of some three hundred architects from the Islamic lands and lists information tied to monuments of Ilkhanid Iran and earlier periods.⁷⁴⁸ A closer and more detailed examination of these signatures is necessary in order to establish if they really are signatures of architects and not of other craftsmen (master builders and builders; see Chapter 4; Section 4.2). This is now possible, due to the expanded amount of information and publications on monuments, compared to the time of Mayer's writing. Further documentation of the monuments for this research additionally provides a source for the discussion of these signatures. In addition to the re-examination of Mayer's work, this research includes an analysis of the signatures which were discovered during the study of the monuments presented in the Catalogue of Monuments appended to the research. It resulted in locating some signatures which seem to be of architects rather than master builders or craftsmen involved in the production of architectural revetment repertoires. These signatures are thus primary evidence for understanding the differences and characteristics of Ilkhanid craftsmen, builders, master builders and architects.

Signatures of pre-Ilkhanid and Ilkhanid Architects According to Mayer

One of the most significant pre-Ilkhanid signatures is located on the surfaces of Gunbad-i Surkh (it is dated 1148). The current reading of the signature is: *Work of the guilty slave, who hopes for God's mercy, Abi [sic] Bakr Muhammad ibn-i Pandan al-banna' ibn-i al-Muhsin al-Maraghi*, but earlier readings propose *mi 'mar* (architect) instead of *al-Maraghi*.⁷⁴⁹ The person who signed the monument is the son of a master builder and was likely a master builder himself, rather than a professional architect. Another monument at Maragha, the Gunbad-i Kabud is signed by its master builder in a now fragmentary inscription, which provides the date of the completion of the funerary structure as 1196-97 and the name *Ahmad ibn-i Muhammad*.⁷⁵⁰ Both

⁷⁴⁵ This is similar to the patronage activities in Qajar period.

⁷⁴⁶ Similar activities are observed for the period of fragmentation of the Great Seljuq Empire.

⁷⁴⁷ Mayer 1956.

⁷⁴⁸ Mayer 1956. See also Mayer 1958; Mayer 1959; Atak 2017.

⁷⁴⁹ TEI 12010 (Consulted on: March 22, 2021); Mayer 1956, 96.

⁷⁵⁰ TEI 8231 (Consulted on: March 22, 2021).

signatures from Maragha indicate that monuments of such dimensions were likely constructed by master builders. Such an interpretation of the signatures is also supported by the signature on the Pir-i Alamdar funerary tower in Damghan, which states the name of the patron of the monument (the son of the deceased buried in the structure) and specifies that the work of the construction of the tower is *Work of 'Ali ibn-i Ahmad ibn-i Husayn ibn-i Shah al-banna' [sic] ibn-i al-banna'*.⁷⁵¹ The signature indicates that the person in charge of monument construction was the master builder who was the son of a master builder and from whom he might have inherited the profession. Another further parallel is provided by the Se Gunbad mausoleum in Urumiya, which Mayer proposes was signed by the architect.⁷⁵² The signature reads: *the poor slave, Mansur ibn-i Musa*. Similar to the other pre-Ilkhanid funerary structures of north-western Iran, this signature most likely indicates the identity of the master builder in charge of the monument's construction. This tradition of construction of funerary structures of limited dimensions, by master builders rather than professional architects likely continued into the Ilkhanid period.⁷⁵³ Similar should be considered for other monuments such as congregational mosques.⁷⁵⁴

Mayer also proposes that the signature on the monumental carved stucco mihrab of the Pir-i Hamza Sabzpush mausoleum of Abarquh, which reads: *Work of Muhammad ibn-i Abi al-Faraj al-'Iraqi*, is the signature of the architect who built the mihrab in the mausoleum.⁷⁵⁵ But this is in fact the signature of the master stucco craftsman who was in charge of the workshop, which produced the mihrab (See the next section of this chapter).⁷⁵⁶ The architectural structure of the monument is of small dimension and of very modest design (domed square chamber) and it did not require the work of a professional architect. Mayer provides a partial reading of the now heavily restored signature on the funerary tower of Barda (Bərdə) in Azerbaijan, the construction of which was completed by 1322. A more complete reading of the signature is: *Work of Ahmad ibn-i Ayyub al-hafiz al-banna' al-Nakhchivani*.⁷⁵⁷ This is most likely the signature of the master mason who was in charge of the construction of the funerary tower or its architectural revetments in tile mosaic medium (in which the signature was produced), rather than a professional architect, who did not need to be involved in the construction of the funerary tower, because it did not present specific challenges of architectural design.

⁷⁵¹ TEI 6355 (Consulted on: March 22, 2021). Blair 1992, 93-94.

⁷⁵² Mayer 1956, 86. In his recent article, Quchani proposes that there are two signatures of this architect on the funerary tower and that it is difficult to discern the nature of his work connected to the construction of the tomb tower. Quchani 2016, 43.

⁷⁵³ Mayer proposes further examples of signatures which he interprets as works of architects. See Mayer 1956, 88.

⁷⁵⁴ Mayer proposes that the architect *Ustad Mahmud bin Muhammad al-banna' al-Isfahani known as al-Ghazi*, dated 1158-60 transformed (*'Amal – work of*) an old mosque into the Congregational mosque of Ardistan, added *iwans* and domes and redecorated it with stucco. But the monument retains two historic inscriptions in carved stucco; one at the end of the monumental inscription running along the supporting walls of the main domed prayer hall of the mosque and a small signature at the end of the historic inscription running along the interior surfaces of walls of the *qibla iwan* of the mosque. The inscription in the interior of the prayer hall reads: *by the hands (of) al-Ustad Mahmud al-Isfahani al-ma'ruf bi-al-Ghazi*; it is a mention of the overseer of the monument construction. The small signature in the *iwan* can be read only partially as *work of Muhammad ibn-i Mahmud al-banna' al-Isfahani*, but as suggested by numerous Ilkhanid examples of such signatures, this is most likely the signature of the master stucco craftsman in charge of the production of the stuccos, rather than the architect of the monument. See Mayer 1956, 85; TEI 7939 (Consulted on: December 10, 2021); Blair 1992, 160-163, no. 61.

⁷⁵⁵ Mayer 1956, 91. TEI 7926 (Consulted on: December 10, 2021).

⁷⁵⁶ This is significant for the understanding of the identity of signatory artists of Ilkhanid stuccos.

⁷⁵⁷ TEI 3364 (Consulted on: December 10, 2021).

Mayer informs that *Hajji Muhammad al-banna' al-Sawaji* in 1330-31 built (work of) the caravanserai at Sin, north of Isfahan.⁷⁵⁸ The caravanserai and its signature, which consisted of a carved stucco plaque, are no longer extant; the signature could pertain to the master builder of the monument or the stucco worker in charge of its decoration. Mayer states that the signature of the mihrab of the Kirman Friday mosque, which is no longer extant, read: *work of Hajji ibn-i 'Inayat Allah ibn-i Nizam al-Din mi'mar-i Isfahani*, the son of the architect who built the no longer extant Qubba-yi Sabz in Kirman.⁷⁵⁹ Given that the signature is located on the mihrab, it seems more likely that this could have been the signature of the master craftsman in charge of the production of the mihrab and not the signature of the monument's architect.⁷⁶⁰ The date of construction of the no longer extant Qubba-yi Sabz in Kirman has been estimated to be 1242-43, but the building might be of a later date. The early research provides the reading of the no longer extant signature on the monument as: *Work of Ustad Khwaja Shukr Allah and Ustad 'Inayat Allah ibn-i Ustad Nizam al-Din, mi'mar, al-Isfahani*. If so, this is one of the few inscriptions which mentions the title of *ustad* (master) and also a relative who was architect – *mi'mar*.⁷⁶¹

Mayer also provides the information regarding the signature of the set of three lustre tile slabs stored in the Metropolitan Museum of Art in New York (Inv. No. 09.87),⁷⁶² which might originate from the 'Abd al-Samad complex in Natanz (Cat. No. 12), stating that the architect *Hasan ibn-i 'Ali ibn-i Ahmad Babuya al-banna'* made this mihrab.⁷⁶³ More recent research on these lustre slabs revealed a second signature from the writer of its inscriptions, indicating that the main signature likely designated the head of the tile production workshop. A related, but longer signature appears also in carved stucco of the shrine of the 'Abd al-Samad complex (on the capitals of the carved stucco columns in the shrine) and on the mihrab of the Mahallat-i Bala Imamzada of Yahya and Fazl (Cat. No. 13). Locations of these signatures, and the reading of their last part, the *nisba al-Vidguli*, indicate that this was likely a master craftsman of carved stucco medium, rather than an architect. This is additionally supported by the evidence provided in this research, which indicates that the architectural structure of the shrine of the Shaykh pre-dates the 1307-08 interventions. It is therefore unlikely that the signature in question pertained to an architect, rather, *banna'* could have been an honorary appellative, or an indication that the same person was also involved in the sector of monument construction, but not professional monument planning. Furthermore, Mayer suggests that *Ibrahim ibn-i Isma'il (al-)banna' (al-)Isfahani*, in 1307-08 erected the mausoleum of Shaykh 'Abd al-Samad.⁷⁶⁴ It is not clear from where the reading of the inscription comes and to which part of the monument it is related. Another signature of a master stucco craftsman (*Haydar ibn-i Asil al-Din?*) is located at the end

⁷⁵⁸ Mayer 1956, 103; TEI 7271 (Consulted on: December 10, 2021).

⁷⁵⁹ Mayer 1956, 64. TEI 3843 (Consulted on: December 10, 2021).

⁷⁶⁰ The signature reading is however informative of the fact that the knowledge of revetment production was also transferred through family ties, similar to the stucco craftsmen family of Damghan.

⁷⁶¹ The signature indicates the lineage of masters through two generations, and also the use of appellative *ustad* (master) and *mi'mar* (architect). It seems that for this monument it was not enough for its construction to be directed by a master builder, but that an expert was called to design the monument and to perhaps oversee its construction.

⁷⁶²

<https://www.metmuseum.org/art/collection/search/445953?searchField=All&sortBy=Relevance&ft=natanz&offset=0&rpp=20&pos=2> (Last Accessed: April 14, 2021).

⁷⁶³ Mayer 1956, 65.

⁷⁶⁴ Mayer 1956, 72.

of the monumental carved stucco inscription band in the northern *iwan* of the Friday mosque of the complex, but it is dated 1309-10.

The re-examination of Mayer's signatures' interpretation from pre-Ilkhanid and Ilkhanid monuments indicates that the majority of listed signatures did not pertain to architects, but to master builders or craftsmen who produced architectural revetments. The majority of presumed signatures is located on monuments which did not require extensive knowledge of planning and designing of architectural forms, which could be learned by example and practice on construction sites. The signatures from Kirman indicate the use of the expression *ustad* (master) and they confirm that for master builders and architects, the know-how was also often transmitted through generations within families of professionals. The analysis indicates that the architects' signatures in the pre-Ilkhanid and Ilkhanid periods were considerably less frequent, compared to what is proposed by Mayer. Instead, monuments most frequently retained signatures of master craftsmen responsible for the production of their revetments.

This research was able to detect two signatures, not noted by Mayer, for which strong evidence exist that they are signatures of actual architects of monuments.

Signatures of Architects on Ilkhanid Monuments – from Monument Documentation

During the research of selected monuments with Ilkhanid carved stucco repertoires, information concerning two cases of architects of monuments was documented.⁷⁶⁵ The scarcity of architects' signatures, compared to the higher number of documented stucco craftsmen signatures, might stem from the fact that architects were not used to signing "their works." It is however plausible that architects were not able to sign the monuments because they were not directly involved in the production of historic inscriptions and architectural revetments. The monuments thus did not comprise architects' signatures, but signatures of the people involved into their construction who had the means or skills to sign them. These scarce pieces of evidence are indicatively informative about architects' practice during the Ilkhanid period.

The first historic inscription was documented at the Pir Husayn Khanqah at Qubalibalaoğlan (Cat. No. 25). The inscription was originally located close to the entrance to the mosque of the complex. It dates to 1203-04 and it was produced in carved stone (a slab). The second historic inscription was documented at the 'Ali ibn-i Abi al-Ma'ali ibn-i 'Ali Safi mausoleum in Qum (Cat. No. 15). It is produced out of carved stucco, in conjunction with the adjacent signature of the master stucco craftsman and it is dated 1359-60. But these inscriptions are not representative of the trends of the Golden or Late Ilkhanid periods. They are nevertheless important pieces of information concerning the roles of architects in monument construction procedure (see the further discussion below).

The two signatures consist of initial parts designating the work in question and they continue by stating the names of the architects which comprise their professional appellatives. Neither of the two signatures comprises any blessings or a *nisba* and they are both relatively short. Differently from signatures of craftsmen who worked in diverse media, the signatures of the two architects do not begin with the usual formulation of "activity" by the means of a specific verb. In both cases the inscriptions begin by specifically referring to the work of the architect with unique formulas (*The architect of this building is...* and *This building is work of...*). It is

⁷⁶⁵ In addition to these, a repetition of one signature has been noted and the existence of a signature of a minaret's architect has also been noted. See below.

thus clear that the writers of these signatory inscriptions did their best to clearly state that these are signatures of architects or of persons in charge of the construction of the monuments. The signature in Azerbaijan refers to the person as the architect (*mi 'mar*), but the Qum inscription employs the term builder (*banna*). The inscription at the Pir Husayn Khanqah is significant because it confirms the existence of a specific expression for the profession of the architect, which was thus a specific role in the process of monument construction.⁷⁶⁶ The Qum inscription refers to a builder, which could be an architect of a lower rank, due to the medium dimensions of the monument, or it could be that this was a Persian expression for architect, which was employed on a monument of a relatively late date when use of Persian for historic inscriptions became more frequent. The Qum signature is significant, because it is combined with a signature of a master stucco craftsman. It therefore illustrates that there was a stucco craftsmen workshop master in charge of the production of stuccos and that there was a master builder in the role of the architect of the structure (these roles were therefore separate). The fact that both signatures in Qum were produced by the stucco workshop, in stucco medium and next to each other reflects the level of interaction and collaboration between the stucco workshop, the construction crew and the architect of the monument. The signature of the master craftsman does not assume a specific form or an elaborate design, but the signature of the architect (which contains the date of completion of the building) is designed into an elaborate roundel and it is incorporated into the revetments programme of the mausoleum's interior, which consisted of several such epigraphic roundels. This might reflect the hierarchy between the architect and the stucco workshop master.

These signatures do not directly inform concerning the role of architects in relation to the monument construction and decoration. It seems logical to assume, as suggested by O'Kane, that for major construction undertakings one person was responsible for its design.⁷⁶⁷ In addition to this, the architect likely guided the builders during the monument construction procedure and craftsmen when they decorated the monuments.⁷⁶⁸ According to Wilber, master builders and masons were capable of supervising the construction of mosques, schools and tombs according to established tradition.⁷⁶⁹ Perhaps, they also supervised craftsmen during the production of architectural revetments.

⁷⁶⁶ O'Kane notes that this expression is not employed on signatures of architects of the Timurid period. It is however used in primary written sources to refer to an architect, as one of the synonyms. O'Kane 1987, 37-39.

⁷⁶⁷ O'Kane 1987, 37.

⁷⁶⁸ This was not the role of the overseer who was responsible for the administration of the site, summoning of builders and craftsmen and financial aspects of the activities, and who did not possess the training of an architect, which was necessary for the supervision of builders and implementation of the building plans and designs into an architectural structure.

⁷⁶⁹ Wilber 1954, 39. This is likely the case, as indicated by frequent occurrence of similar structure types across a larger geographical unit in the Ilkhanid Empire. This research illustrates that the mausoleum structures in the area of Na'in, Yazd and Abarquh and other areas, employed similar ground plans and transitional zone solutions, which were inherited from Seljuq builders. The construction of these monuments therefore presents a use of a standardized form and types of a funerary architectural structure.



Figure 59: Signature of the Pir Husayn Khanqah architect, now in the National History museum of Baku. The signature reads: *the architect of this construction is Shahzada Habibullah ibn-i Shaykh Hajji Muhammad.*

The Architect Signature of the Pir Husayn Khanqah at Qubalıbalaoğlu (1203-04)

Fig. 59.

Further information concerning the role of Ilkhanid architects can be proposed based on observations of the monuments where the two signatures have been documented. At the Khanqah of Pir Husayn at Qubalıbalaoğlu (Cat. No. 25), the analysis of the entire epigraphic repertoire of the monument, its ground plan and stages of construction and decoration provides some information. This monument retains several signatures of personages involved in its construction, which comprised several stages and various decorative interventions. The signature of the architect (*The architect of this building is Shahzada Habibullah ibn-i Shaykh Hajji Muhammad*) is one of the earliest dated inscriptions of the complex (1203-04) and it was part of the formative period of the monument, which concluded with the drawing of its waqf in 1243-44. In the subsequent period from the mid-thirteenth century onward, the monument was redecorated in at least two separate interventions with a monumental carved stucco mihrab for the mosque and an extensive programme of lustre tiles for the cenotaph and the shrine of the Shaykh and perhaps the mosque's interior. Moreover, the minaret of the complex retains its own signatures of the craftsmen involved in its construction, and one of the historic inscriptions specifically informs that the architect of the minaret and the builders of the minaret were different persons.⁷⁷⁰

⁷⁷⁰ It reads: *the architect of the minaret is Shams al-Din Muhammad ibn-i Abi al-Abbas. Work (of) Mahmud ibn-i Ibrahim.* It dates to early 14th century. See Cat. No. 25.

Drawing on these pieces of information it is plausible that architect's signature (from 1203-04) is the signature of the architect responsible for the construction activities of the formative period of the complex. The tasks of the architect therefore most likely comprised drawing the ground plan of the complex with the specific arrangement of its fortified enclosure and different structures within it (the shrine of the Shaykh, the mosque, stables, etc.). The architect likely supervised the group of builders in charge of the monument construction, which were also led by the master builders. It is also important to note that the specific historic inscription from the minaret indicates that there were architects who specialized in minaret construction and that they likely headed minaret building workshops.⁷⁷¹ The described abundance of craftsmen's signatures and those of the two architects at the Pir Husayn Khanqah might reflect the prestigious status of the complex construction and the involvement of state officials in its patronage. On the other hand, such signature could reflect a lack of construction site supervision and consequent greater freedom of the master builders.⁷⁷² These signatures might also reflect trends that were more characteristic of the Ilkhanid hinterlands and the socio-political climate in the territory governed by the Shirvanshah dynasty.

The Architect Signature of the 'Ali ibn-i Abi al-Ma'ali ibn-i 'Ali Safi mausoleum in Qum (1359-60)

Fig. 60.

The 'Ali ibn-i Abi al-Ma'ali ibn-i 'Ali Safi mausoleum in Qum is one of the three mausolea located in the Bagh-i Sabz (see Cat. No. 15). This research has illustrated that the three structures are closely related in terms of architectural design and from the point of view of their extensive interior decorative programmes in carved stucco. The 'Ali ibn-i Abi al-Ma'ali ibn-i 'Ali Safi mausoleum stucco programme retains the signature of the master stucco craftsman in charge of the production of the mausoleum's stuccos (*Work of 'Ali ibn-i Muhammad ibn-i Abi Shuj'a al-banna'*). In addition to this, it also retains a likely signature of the architect of the monument (*This building is work of Hasan ibn-i 'Ali ... Abi al-Banna' and (this) is written in Rajab of the year 761/1359-60*).⁷⁷³ The formulation of this inscription and its content, when compared to the craftsman's signature and the monumental historic inscription stating the function of the building and identity of personages buried, leave little doubt that the signature is that of the architect.

The mausoleum was constructed in a single constructive and decorative campaign. It is a medium dimension structure, but similar to the other two adjacent mausolea, it retains elaborate designs of its elevations and a masterly thought-out system of transitional zone in its interior. The role of the signature architect was to design the ground plan and elevation of the monument and to lead the construction team together with master builders and stucco craftsmen. It is likely that the two adjacent mausolea are the work of the same architect. Another signature of the same architect at near-by Khalijistan indicates that this architect likely operated locally, in the region of Qum. The architect cooperated with the stucco craftsmen's workshops, which is reflected in the intrinsic relation between the stuccos and the architectural structures of the mausolea at the Bagh-i Sabz. The discussed case indicates that specialized architects were also

⁷⁷¹ This is not dissimilar from the proposed phenomenon of the *minareci* groups in the Ottoman Empire, especially the Balkan peninsula. See Goodwin 1976; Grbanovic 2018b, 113.

⁷⁷² Lorenz Korn, personal communication to the author.

⁷⁷³ Another signature of the same architect has been documented in the Khadija Khatun mausoleum in Khalijistan near Qum. Tabataba'i 1976, Vol. 2, 202-206; Hillenbrand 2014, 82; endnote no. 49. See also Cat. No. 15.

employed for Ilkhanid monuments of medium and smaller dimensions. This might reflect the prestigious status of the commissions at Bagh-i Sabz, which were connected to the local rulers of Qum.

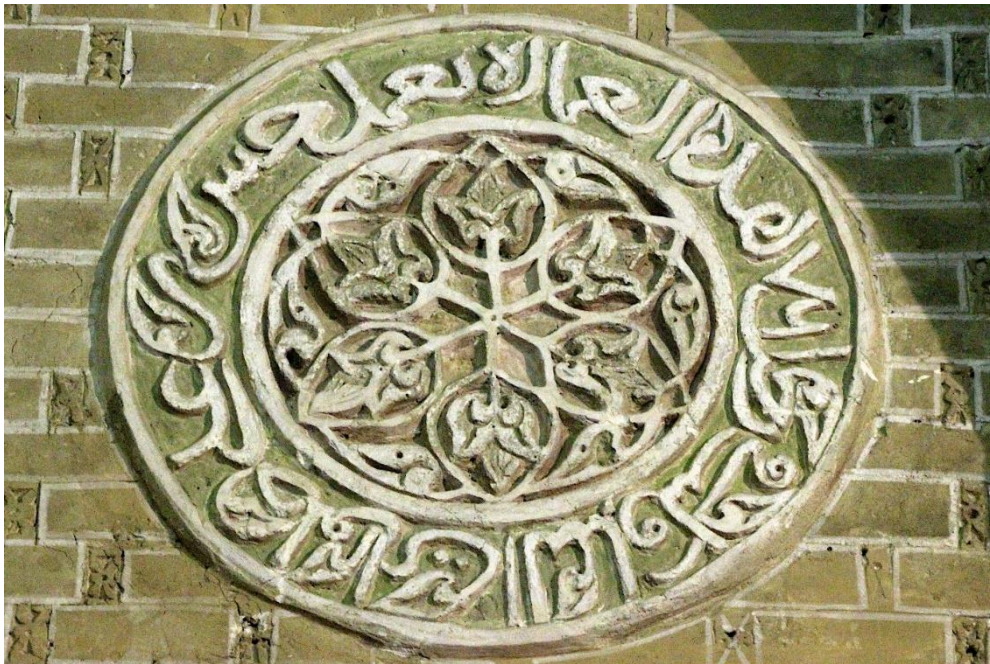


Figure 60: Architect's signature of the 'Ali ibn-i Abi al-Ma'ali ibn-i 'Ali Safi mausoleum (Qum) is designed into a decorative medallion in carved stucco. The signature reads: *This building is work of Hasan ibn-i 'Ali ... Abi al-Banna' and (this) is written in Rajab of the year 761/1359-60.*

Islamic Architects in a wider Chronological Context – the case of the Timurid Architect Qawam al-Din ibn Zayn al-Din Shirazi

The mentioned scarcity of information concerning architects during the Ilkhanid period can be partially compensated for by the information from the later Timurid period, which allows the proposition of some hypotheses concerning Ilkhanid architects. One such well-known case is presented by the architect Qawam al-Din ibn-i Zayn al-Din Shirazi,⁷⁷⁴ whose signatures have been documented on the mosque of Gawhar Shad in Mashhad and the Ghiyasiyya madrasa in Kharghird. This is the only Timurid architect who is also mentioned in primary written sources in which he is referred to as the *ustad* (master) and which state that he was an expert in *muhandasi* (engineering or geometry), *tarihi* (drawing or design) and *mi'mari* (building).⁷⁷⁵ This architect is referred to in the signatures on monuments as *ustad* and once as *tayyan*.⁷⁷⁶ This indicates that it is difficult to discern signatures of architects on monuments, unless there are primary written sources mentioning them, which, as indicated, is rarely the case.⁷⁷⁷ It is important to note that the architect in question was trained in several types of knowledge and that through his career and by the means of buildings he designed, he was considered an architect. Moreover, the signature of the architect at the Gawhar Shad mosque in Mashhad was composed and designed by a different person (by the professional calligrapher Bayshungur, the

⁷⁷⁴ See O'Kane 1987, 37-38; Wilber 1987; Golombek and Wilber 1988, Vol. 1, 189-194; Babaie 2011.

⁷⁷⁵ Wilber 1987, 31.

⁷⁷⁶ Translated by Wilber as a mason working in mud brick or clay. According to O'Kane, it means: *plaster worker*. Wilber 1987, 31, 33; O'Kane 1987, 37-38.

⁷⁷⁷ See also Golombek and Wilber 1988, Vol. 1, 65-66.

son of Gawhar Shad)⁷⁷⁸ indicating that differently from architectural revetment craftsmen, the architects did not design their own signatures. This might explain the lesser frequency of occurrence of signatures of architects on Islamic monuments.⁷⁷⁹ Designs and plans of structures which this architect designed reveal certain structural innovations and a high level of creativity in arrangement of architectural spaces and elements. The described case of the architect and his works is therefore comparable with the Ilkhanid projects on the imperial level such as the Uljaytu mausoleum at Sultaniyya, the Ghazaniyya or the Rashidiyya. This was not necessary for smaller dimension monuments, which could be designed and constructed by master builders.

Conclusion

There exists limited evidence concerning the identity of architects of Ilkhanid monuments. The section provides a revision of Mayer's interpretations of architects', master builders' and craftsmen's signatures on monuments, proposing that one of the essential professions involved in construction of diverse Ilkhanid monuments was that of an architect, who likely possessed the skills of a designer, engineer and a knowledge of building. However, this role was frequently played by master builders. Especially small dimension monuments were designed and built by master builders who supervised their groups of builders in erecting monuments according to frequently employed plans and architectural solutions, which were already established in pre-Ilkhanid period. For more complex projects, which required tailored solutions and which occasionally employed structural solutions of innovations and more extensive dimensions, work of professional architects was of essential significance, but this still requires further research. Although Wilber separates construction of structural cores from the procedure of production of architectural revetments into two separate stages, the evidence gathered and presented in this research indicates that monument designers had to collaborate with experts for revetment production at the time of the monument design and construction.⁷⁸⁰ Architects thus not only collaborated with builders, but they also had a close relationship with heads of workshops in charge of production of revetments in diverse media. It has also been shown that the lesser frequency in occurrence of signatures of architects is likely tied to the fact that revetments were produced by craftsmen and not architects and that more extensive groups of workers predominated over single individuals. Moreover, they are only exceptionally mentioned in written sources. This resulted in the lesser visibility of architects in the art historic and historiographical studies of monuments, despite their roles being essential for monument construction.

⁷⁷⁸ Wilber 1987, 33.

⁷⁷⁹ According to Prak, the lesser occurrence of architects' signatures (compared to craftsmen's signatures) reflects the dominant role of the community of builders over a single individual who was the creator of the project. Prak 2011, 389.

⁷⁸⁰ See, for example: Golombek and Wilber 1988, Vol. 1 65-66.



Figure 61: Locations of Ilkhanid stucco craftsmen's signatures presented in details the Appendix No. 5 to this Chapter.

b.) Stucco Craftsmen Workshops' Signatures

Fig. 61.

Background

One peculiar aspect of Ilkhanid stuccos is the increasingly frequent occurrence of craftsmen's signatures on their works (see Appendices to the Chapter, Nos. 4, 5). This might reflect changes in craftsmen's social status. These signatures provide evidence to support hypotheses of workshop mobility, indirect dating of stuccos and family ties between craftsmen. The specific nature of stucco production and design transfer might be reflected in the signatures and identity of signatory artists. There has, as yet, been no systematic study of Ilkhanid craftsmen's signatures; stucco signatory artists are currently understood to have either been stucco workshop heads or the manuscript calligraphers who designed the stuccos.⁷⁸¹ At least forty-three craftsmen's signatures (see Chapter 1; Section 1.4) are found on Ilkhanid architectural repertoires in wood, stone, wall painting, tile and terracotta, of which some twenty-eight are documented on carved stuccos.

The examination of these twenty-eight signatures and stuccos provides information about the identity, profession and mobility of artisans and stucco workshops' composition. It goes beyond traditional examinations of craftsmen's signatures, which have primarily been concerned with their semantic meaning, their location on stucco revetments, and, in particular, the identification of craftsmen and the determination of their degree of mobility based on the *nisbas* in their

⁷⁸¹ For one recent work of preliminary nature, see Salihi and Taghavinejad 2017.

signatures.⁷⁸² To this end, the study suggests that both the signature and the stucco revetment should be considered as one. These findings are valuable for a better understanding of stucco production technology and aesthetics, as well as the identity of artists, their migration routes, craftsmen's workshop structures and their relationship to patrons who commissioned stuccoworks.

Ilkhanid Stuccos and their Signatures

Figs. 62-63.

The frequent and geographically constant occurrence of signatures on architectural revetments of the Ilkhanid period is significant in comparison to the much lower frequency with which they are noted in earlier periods. The Ribat-i Sharaf craftsman's signature (1154-1155) is one of the best examples of Seljuq craftsmen's signatures and illustrates that these signatures were fully developed and a common practice in pre-Ilkhanid times (with further contemporary examples found on some Seljuq monuments in Anatolia and a few in the Iranian territory). However, craftsmen's signatures in carved stucco in Iran are virtually absent up until the Ilkhanid period. The only three known examples⁷⁸³ are the recently discovered carved stucco mihrab of the Zuzan mosque, which most likely dates to the 11-12th centuries,⁷⁸⁴ the stucco repertoire of the Ardistan Friday mosque (1158, 1160)⁷⁸⁵ and the carved stucco mihrab of the Pir-i Hamza Sabzpush mausoleum in Abarquh, dating from the second half of twelfth century.⁷⁸⁶

Ilkhanid signatures in carved stucco are all preceded by the word '*amal* (work of) and include first names, *nisbas*, professional appellations and blessings; some contain dates while others can be dated based on their architectural context. They are mainly written in Arabic, occasionally containing sections in Persian (e. g. the Varamin Friday mosque signature; Cat. No. 28). They could be located on mihrabs, at the end of monumental inscription friezes, as separate panels, or in proximity to the focal points of architectural spaces. Their locations imply that they were clearly intended to be visible to viewers; they are placed in focal points of stucco repertoires and in areas which can be seen from the ground where the faithful and the literate audience would have been standing. Furthermore, they are most often written in cursive scripts, most frequently in *Naskh*, which was easy for a literate audience to read. This must have been a reflected choice of the craftsmen, because many stuccos featured more difficult-to-read inscription styles such as variations of Kufic. Rather than being discrete, these signatures often assume conspicuously large dimensions and long formulations. Placement of signatures might have been determined by every workshop and should be interpreted as its marker. Together with further technological changes, these signatures represent specific characteristics of Ilkhanid stuccos.

⁷⁸² Compare to Salihi and Taghavinejad 2017.

⁷⁸³ I thank my colleague Iman Aghajani for pointing the two signatures out to me.

⁷⁸⁴ Adle 2015, 105-110; 255-56.

⁷⁸⁵ Qasimi, 2004, Vol. 7, 32-41; https://archnet.org/sites/2858#item_description (Last Accessed: June 7, 2021).

⁷⁸⁶ Karimy and Holakooei 2015, 400-402.

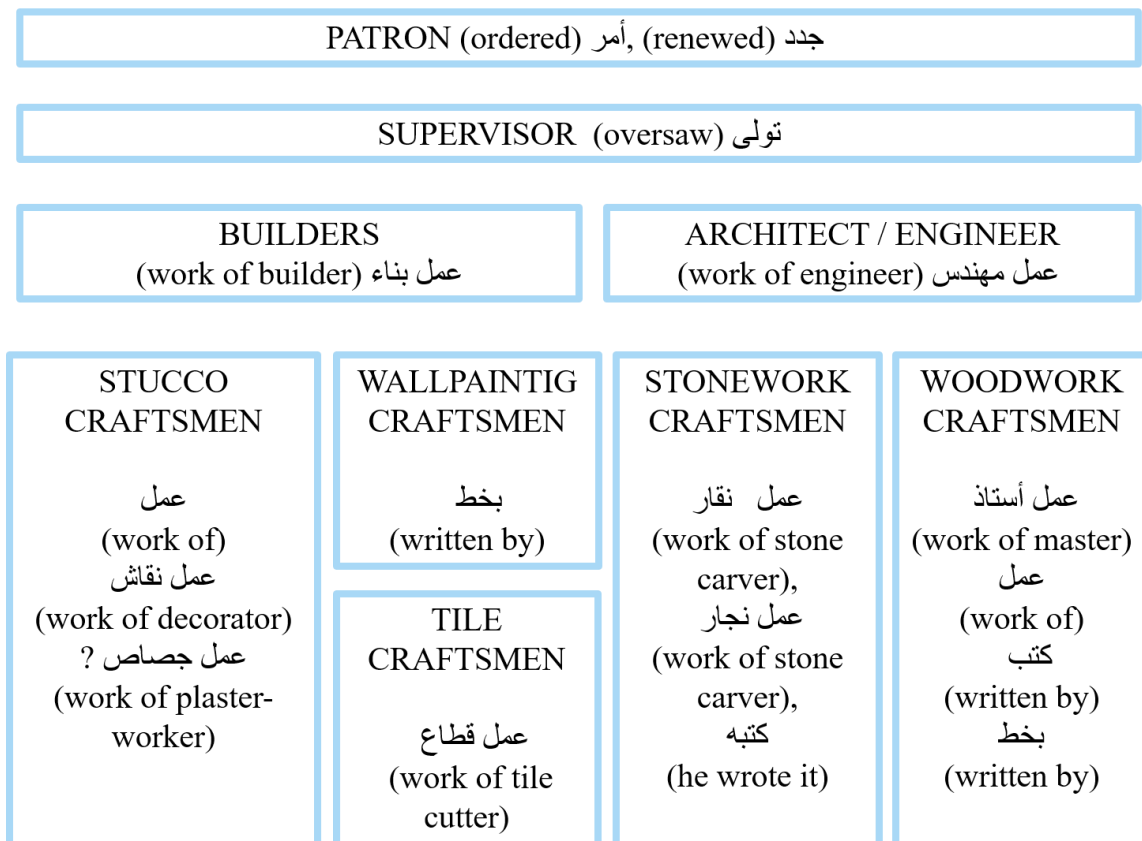


Figure 62: Verbs and professions connected to Ilkhanid monument construction and interventions for production of architectural revetments in different media.

Stucco Signatures and their Structure

For carved stuccos the only verb which was employed was *work of* ('amal) and it has been documented in at least 22 cases (84,6 %).⁷⁸⁷ After the verb, the signatures continued by stating the name of the stucco master, all of whom were male craftsmen.⁷⁸⁸ The names could include a *nisba* and a professional appellation. *Nisbas* were employed more frequently (19 cases; 73 %), compared to professional appellatives (13 cases; 50 %). A closer look at *nisbas* of master stucco craftsmen illustrates that there was very frequently (in 13 out of 19 cases; 68,4 %) a relation between the *nisba* of the signature craftsman and location of the monument (the settlement names where the monuments stand occasionally relate to *nisbas* of craftsmen's signatures). This does not necessarily mean that *nisbas* of craftsmen are geographical, but it indicates that there is a greater likelihood the majority of these craftsmen were of local origin, rather than mobilized from afar. The meaning of professional appellatives of craftsmen is more difficult to interpret correctly. In five cases the appellation is *muhandis* (engineer, geometer), in nine cases *banna'* (builder), in once case *bandigir* (builder?), in one case *naqqash* (painter, designer) and in one case *jassas* (plaster maker). These signatures normally end after stating the name of the stucco master. On some occasions they comprise blessing formulas at their end.⁷⁸⁹

⁷⁸⁷ This demonstrates consistency in designating the work of stucco masters with the verb, which should be considered a kind of formula.

⁷⁸⁸ As demonstrated in the research these were the names of the craftsmen who were heading stucco workshops.

⁷⁸⁹ Especially frequent use of blessings to the craftsmen, their families and sometimes to the faithful, was a hallmark of the Damghani stucco craftsmen's family.

Ilkhanid Architectural Revetments and their Double Signatures

Extensive studies of Ilkhanid lustre tile signatures, especially publications by Blair and Abdullah Quchani,⁷⁹⁰ detail the division of work and tasks in ceramic workshops and point towards the conscious use of specific expressions to denote the work of different artisans.⁷⁹¹ These double signatures provide information concerning different roles adopted by artisans in the tile production process, which was divided into stages including design, moulding, hand working, colouring and lustre application procedures. The best example of such an inscription is found on the set of tombstone tiles from the Imamzada Yahya in Varamin (Cat. No. 36), dated 1305;⁷⁹² it contains the signature of the calligrapher, who presumably designed the inscriptions at the very least, and the signature of the head of the workshop responsible for the tiles' production.⁷⁹³ The signature on the lustre mihrab from the same monument, however, indicates that the same craftsman may have been responsible for both the production and design of lustre revetments. Another example of a double inscription is located on the lustre panel which might have covered the cenotaph of the tomb of Shaykh 'Abd al-Samad (dated 1309-10; Cat. No. 12). The small signature of the *writer* in lustre material denotes the calligrapher of the panel. The main signature, *work of Hasan 'Ali ibn-i Ahmad Babuya al-Banna'*,⁷⁹⁴ suggests he was the head of the lustre craftsmen's workshop. His profession, *al-banna'* (the builder), indicates that this same person may also have worked in the building sector, although this seems to have been neither a frequent nor a common practice. Further examples include the two Ushturjan Friday mosque signatures in sgraffito tiles (on its northern entrance portal; Cat. No. 4), which show that the work on the mosque's exterior redecoration (1315-16) was led by the builder or mason, Ahmad, and that the production of ceramic revetment work was directed by the tile cutter, Hajji Muhammad.⁷⁹⁵ There is the only one known double signature in carved stucco, which is located in the Imamzada 'Ali ibn Abi al-Ma'ali ibn-i 'Ali Safi (761/1359-60; Cat. No. 15) in Qum and it denotes the work of the stucco craftsmen and the architect (see above).⁷⁹⁶

Detailed observations of single and double craftsmen's signatures demonstrate that different words (nouns or verbs) were employed to accredit the authors of architectural revetment production.⁷⁹⁷ Double inscriptions in woodwork, stonework, wall painting, tilework and lustre tile production reveal that the word *'amal* (work of) normally designated the head craftsman of the revetment workshop. These signatures were occasionally accompanied by *kataba* (he wrote), *bi-khatti* (in the writing of) or *katabahu* (he wrote it), to give the name of the designer or the maker of the work or its epigraphic content. The only word used on Ilkhanid stucco signatures is *'amal* (work of), and signatures denoting writing, making of inscriptions or design are entirely absent. This implies that stucco designers either did not sign their work, which would not reflect a common practice in the Ilkhanid period, or that the designers' and

⁷⁹⁰ See Blair 1992, 407-435; Quchani 1992.

⁷⁹¹ Grbanovic 2020, 610-612, 619.

⁷⁹² Hermitage Museum, St. Petersburg (Inv. No. IP-1594).

⁷⁹³ See Blair 2016.

⁷⁹⁴ Blair 1986a, 62.

⁷⁹⁵ Double signatures are also found in carved wood. The Ilkhanid minbar (1311) of the Na'in Friday mosque contains calligrapher's work signed *bi-khatti* (written by) and the head of the workshop's signature preceded by *'amal* (work of). Grbanovic 2017a, 68; Grbanovic 2020, 610.

⁷⁹⁶ See Tabataba'i 1973, 36-47.

⁷⁹⁷ Grbanovic 2020, 610-612, 619.

calligraphers' work was performed by one of the stucco workshop's craftsmen.⁷⁹⁸ Logically this task would have been undertaken by the most experienced stucco master - the head of the workshop. According to the existing research, there were differences between the verbs '*amal* (work of) and *sun'at* (from: *sana'a*, to make, to manufacture), which designated works produced by numerous craftsmen: *sana'a* might have been employed for works of higher standard compared to '*amal*.⁷⁹⁹ *Sana'a* is not encountered in Ilkhanid carved stuccos, but it is found in lustre tile medium, although very infrequently.⁸⁰⁰ Especially stuccos are unequivocally signed as '*amal* (work of) and no other verb is employed to denote work of stucco craftsmanship.

Ilkhanid Stucco Craftsmen's Professions

Fig. 63.

Some Ilkhanid stucco craftsmen's signatures also contain professional titles, such as: *bandigir* (mason), *muhandis* (engineer or geometer), *banna'* (builder), *naqqash* (designer) or *jassas* (plaster worker).⁸⁰¹ These professional titles are not encountered with a frequency sufficient to determine their exact meaning; they should be interpreted as giving an indication of connections between the stucco crafts and monument construction, rather than as strict denominations of professions. The difficulties in understanding the semantic meaning of craftsmen's signatures, as outlined here, require a closer look at the stucco design and production process, which provide information about production technology and work division within stucco workshops and thereby contextualise the interpretation of craftsmen's signatures.⁸⁰²

Quantitative Information Concerning Characteristics of Ilkhanid Stucco Craftsmen's Signatures

The twenty-eight documented craftsmen's signatures were analysed quantitatively from different perspectives to discern their more detailed characteristics. These twenty-eight signatures in carved stucco medium were documented on seventeen monuments, out of a total of fifty monuments. This indicates that around 40 % of the monuments with carved stucco repertoires retain information concerning the master stucco craftsmen responsible for production of stuccos.⁸⁰³

Repeating Signatures

In several cases where stucco repertoires were more extensive and required the craftsmen to work in several segments, the signatures of the same craftsmen are found on different parts of the stucco repertoires. The best such examples are the signatures on the Burj-i Kashana and the Bistam Friday mosque (Cat. No. 18), the Bayazid Bistami complex at Bistam (Cat. No. 19) and

⁷⁹⁸ Grbanovic 2020, 610-612, 619.

⁷⁹⁹ Mayer 1956, 24.

⁸⁰⁰ It is employed for one of the signatures on the lustre tile mihrab from the Imamzada Yahya in Varamin (Cat. No. 39), dated 665/1265, which is now part of the Doris Duke Foundation collection (Inv. No. 48.327). <https://collection.shangrilahawaii.org/objects/4334/cobalt-and-turquoise-glazed-molded-lusterware-mihrab-prayer?ctx=02f14f474dd8183ad2de456e06977ed72ba06a71&idx=0> (Last Accessed: April 14, 2021).

⁸⁰¹ Grbanovic 2020, 619.

⁸⁰² New research findings concerning the stucco design transfer and stucco production have been published in: Grbanovic 2020, 608-610. Only a summary of said findings is provided here.

⁸⁰³ It is interesting to note that architectural revetment repertoires in wall painting and applied moulded and stencilled stuccos do not retain signatures of the craftsmen who produced them.

the Farumad Friday mosque (Cat. No. 16).⁸⁰⁴ The signatures of the Burj-i Kashana entrance portal are dated to 1300-01, the signature at the adjacent Friday mosque is dated 1306-07 and the signatures on the monumental exterior inscriptions on top of the supporting flanged walls of the Kashana funerary tower are dated 1308-09. These dated craftsmen's signatures are informative of the chronology of construction and decoration of the funerary tower and the rebuilding of the Ilkhanid congregational mosque adjacent to it. They demonstrate that the works of stucco production began at the entrance portal of the tomb tower, as the tower and the mosque structure were being constructed. Upon the completion of the entrance portal of the tower, the craftsmen decorated the *qibla iwan* of the mosque with the carved stucco repertoire. Later, they moved to work on the top areas of the tomb tower's external surfaces. The craftsmen were therefore present at the site at the time of the construction of the two monuments and they worked in sequence.⁸⁰⁵

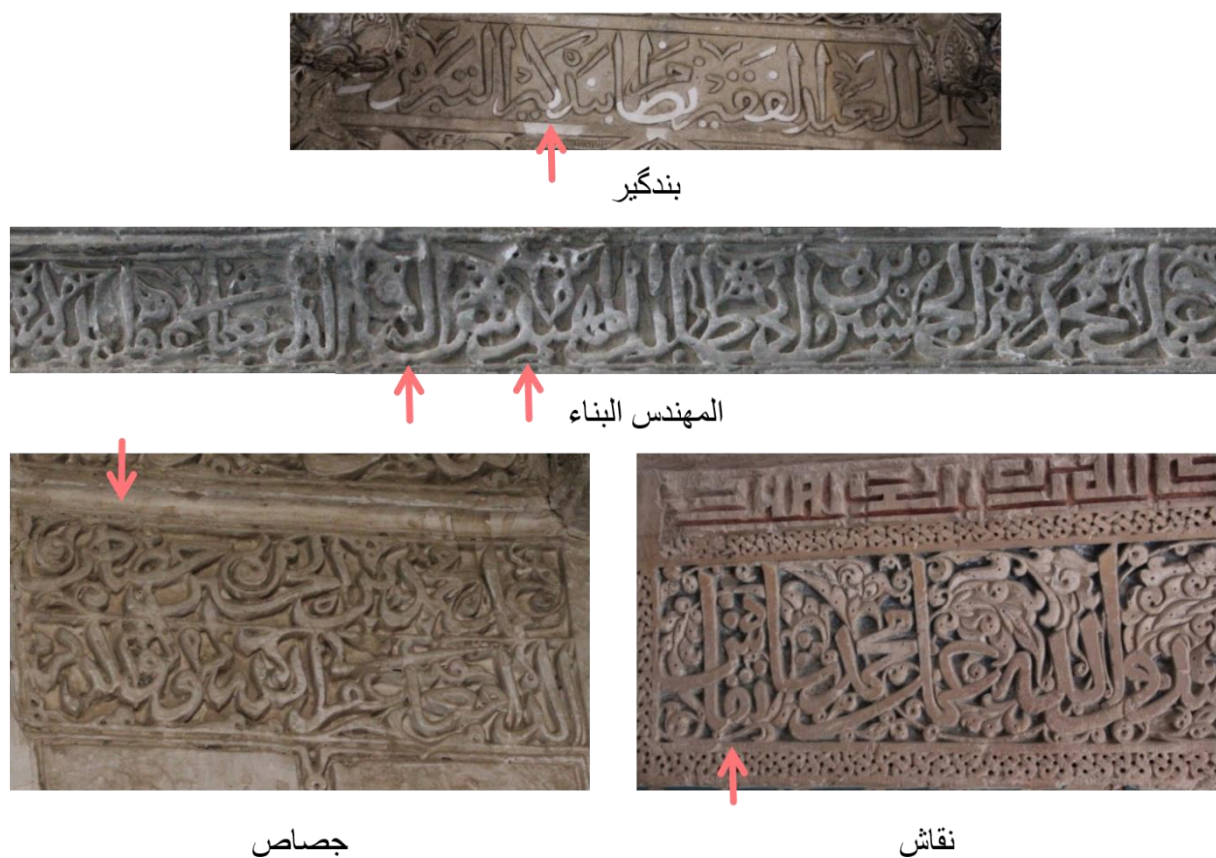


Figure 63: Documentation of professional appellatives of Ilkhanid stucco craftsmen.

⁸⁰⁴ Further such examples comprise the 'Abd al-Samad complex at Natanz (Cat. No. 12) and the Turbat-i Jam complex (Cat. No. 33).

⁸⁰⁵ A similar phenomenon is observed in the Bayazid Bistami complex stuccos, where the signed mihrab and seclusion rooms are dated 1306-07 and the entrance portal (the Uljaytu portal) signature in stuccos, by the same master craftsman, is dated 1313-14. The craftsmen therefore moved around different parts of the complex to complete stucco repertoires and they signed each of them at the time of its conclusion. A similar procedure has also been observed in the four fragmented, difficult to read signatures on different parts (the mihrab, the entrance portal, the small *iwan*, the *qibla iwan*) of the Farumad Friday mosque (Cat. No. 16).

The Chronological Context of Signatures

Fig. 64.

Research of Ilkhanid stucco signatures, their stucco repertoires and the chronology of monuments' construction and decoration provides some information concerning the chronological context of the craftsmen's use of signatures of carved stuccos. The quantitative analysis revealed that stucco repertoires from the Proto Ilkhanid period (1221-1256) were not signed by their craftsmen. The first signature (and the only one) was employed in the Early Ilkhanid period (1256-1295) on the Urumiya Friday mosque mihrab (Cat. No. 23), which could however be the work of a later redecoration (see the monument discussion). The majority of signatures (17 cases; 65 %) dates to the Golden Ilkhanid period, but a considerable number has been documented in the Late Ilkhanid period (8 cases; 31 %).⁸⁰⁶ These finds might indicate that the spread of the practice of signing the stuccos is similar to lustre tile and glazed media and different from wall painting and applied moulded and stencilled stucco repertoires. The described practice of signing architectural revetment repertoires continued in post-Ilkhanid times in different media and especially in tile mosaics.⁸⁰⁷

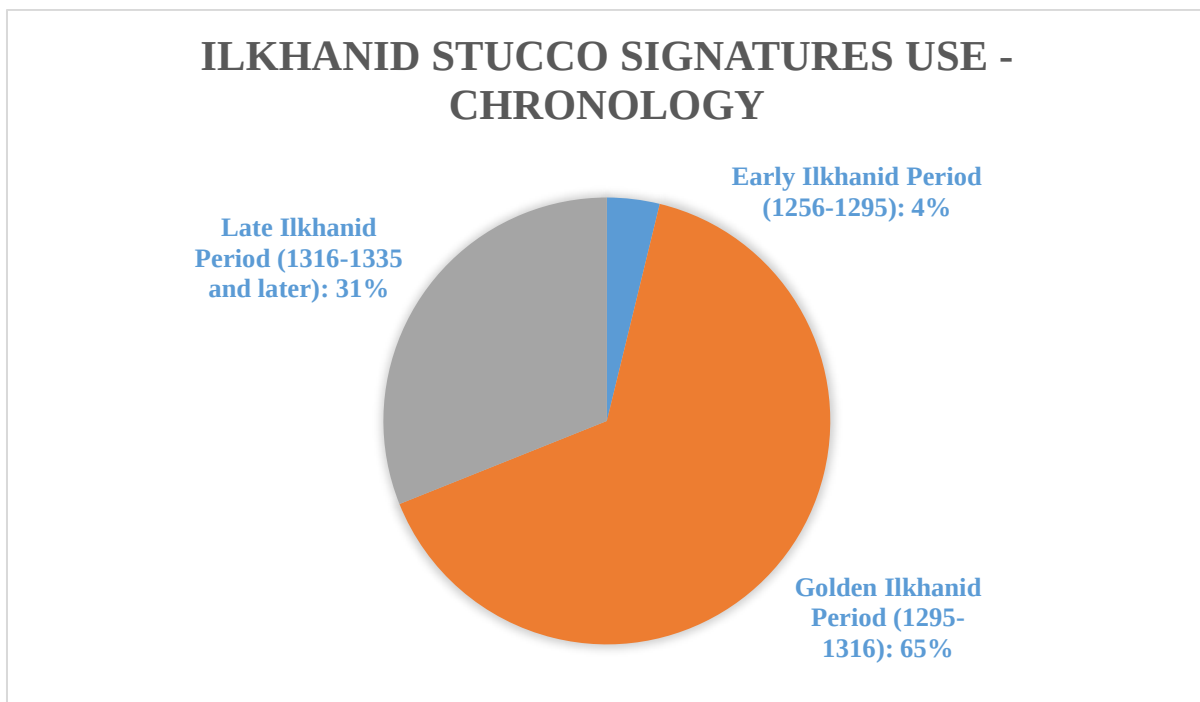


Figure 64: Documented chronological context of use of Ilkhanid stucco craftsmen's signatures.

⁸⁰⁶ The trend is similar and correlates to the trends of monuments patronage, for which it has been shown in the previous section that a large number of interventions comprising production of carved stuccos was performed not only in the Golden but also in the Late Ilkhanid period.

⁸⁰⁷ Perhaps two best examples are sets of signatures in tile mosaic medium in the monumental domed prayer hall of the Yazd Friday mosque and the domed room of the Imami madrasa of the Isfahan Friday mosque. Tile mosaics of the Varzana Friday mosque are also signed. These signatures are however more detailed and they comprise names of architects and other personages involved into the revetment production projects.

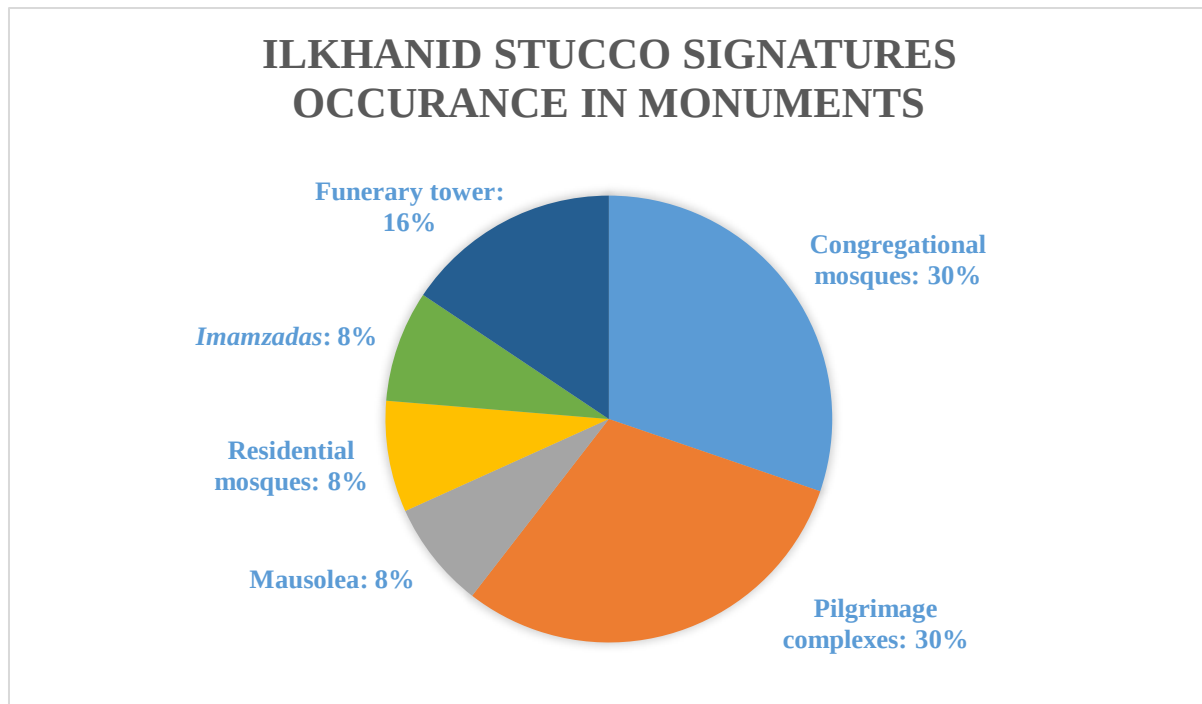


Figure 65: Occurrence of Ilkhanid stucco signatures according to the monuments' primary function.

Stucco Craftsmen's Signatures and the Monument Types

Fig. 65.

The following frequency of signatures on the stucco repertoires of different monuments has been recorded: The signatures occurred most frequently in congregational mosques (8 cases; 30 %) and pilgrimage complexes (8 cases; 30 %). Several signatures are located on a funerary tower (4 cases; 16 %). Occasionally, signatures are found on other monuments, such as residential mosques (2 cases; 8 %), mausolea (2 cases; 8 %) and *imamzadas* (2 cases; 8 %). Signatures occur more frequently on monuments which functioned as significant religious public spaces, such as congregational mosques and pilgrimage complexes. But the documented signatures are the extant ones; there could originally have been more signatures on minor monuments which were not looked after and consequently lost. It is plausible that the commissions of decorating congregational mosques and pilgrimage complexes were more prestigious, compared to most smaller dimension monuments (such as residential mosques, *imamzadas*, mausolea, etc.). If so, it is possible to hypothesize that more prominent stucco craftsmen's workshops were employed for more important commissions. These workshops could have been more prompt to sign their works due to their acknowledged status.⁸⁰⁸

Stucco Signatures' Locations in Stucco Repertoires

The research demonstrates that signatures were most frequently located on stucco mihrabs (11 cases). Signatures were frequently located on entrance portals (4 cases), at the end of monumental inscription bands (4 cases) and on surfaces of *qibla* and other *iwan* structures (5 cases). Occasionally, stuccoworks were signed on stucco panels in seclusion rooms, on stucco columns, surfaces in prayer halls and on supporting walls of monuments (4 cases). Regardless of the dimensions of the stucco repertoires, signatures were systematically located in the most

⁸⁰⁸ Further research would be needed to confirm this hypothesis.

significant architectural spaces and on surfaces, which presented focal points of the repertoires. Signatures were thus intended to be seen and read. This is also suggested by the type of inscription styles (above all *Naskh*, and only exceptionally Kufic style) employed to produce signatures; they were meant to be easy to decipher and read.

DAMGHANI CRAFTSMEN FAMILY SIGNATURES

BISTAM FRIDAY MOSQUE	عمل محمد بن الحسين بن ابي طالب المهندس البنا الدامغاني	
BURJ-I KASHANA	عمل حسين بن ابي طالب المهندس الدامغاني	
	عمل محمد بن الحسين بن ابي طالب المهندس البنا الدامغاني	
BAYAZID BISTAMI COMPLEX	عمل محمد بن الحسين بن ابي طالب المهندس البنا الدامغاني و أخوه حاجي	
	عمل محمد بن الحسين بن ابي طالب المهندس بقاء الدامغاني	
	عمل محمد بن الحسين جصاص الدامغاني	
DAMGHAN MOSQUE STRUCTURE	عمل حاجي بن الحسين البنا الدامغان	Signature no longer extant

Figure 66: Documented signatures of the Damghani stucco craftsmen.

c.) Ilkhanid Stucco Signatures and their Context

The Signatures of Bistam and Damghan Stuccoworks - the Family Business

Fig. 66.

Ilkhanid stuccos in Bistam and Damghan carry signatures belonging to craftsmen from the same family.⁸⁰⁹ Their signatures are conspicuously long, and they are placed on visible parts of revetments; occasionally they are even integrated into Qur'anic texts. The Uljaytu entrance portal (1313) of the Bayazid Bistami complex (Cat. No. 19) contains a unique signature which mentions the *jassas* (plaster worker) profession, but the same craftsman signed his other works as *muhandis* (engineer or expert of geometry) and *banna'* (builder). These three professions establish the sectors in which the craftsman worked and the ties between them. The father and son signature (1308-09) on the two external monumental inscription bands of the Burj-i Kashana (Cat. No. 18), provide evidence of family ties between the master craftsmen in the workshop.⁸¹⁰ A damaged signature (1306) on the stuccos of the Bistam Friday mosque (Cat.

⁸⁰⁹ Blair provides the first meticulous study of these signatures. Blair 1982.

⁸¹⁰ Moreover, the signatures of the same craftsmen on the stuccos of the tomb tower's entrance portal, which predate the aforementioned father and son signature in the monumental inscriptions atop the tower, suggest that

No. 18) informs that the monument was decorated by the Damghani stucco craftsmen's family and another of the family's signatures could previously be found on the no longer extant stuccos of the Ilkhanid mosque structure next to the Pir-i Alamdar tower in Damghan.⁸¹¹ Moreover, at the nearby Farumad Friday mosque (Cat. No. 16), the mutilated and now illegible signature in the individual panel above the monumental mihrab⁸¹² indicates that the same craftsmen produced the stuccos of the *qibla iwan* ceiling, the muqarnas decoration, the monumental inscription bands and the mihrab during a single intervention; they signed other parts of the monument (the entrance portal, the mihrab, the smaller *iwan*) separately when they performed their work on the monument. The placement and method of production of two out of the four signatures at Farumad are reminiscent of the Damghani artisan family's approach to signing stuccos.⁸¹³

In sum, the Damghani craftsmen's signatures directly express the family ties between signatory artists who worked in the same workshop. These signatures are formulated in a similar manner; they start with '*amal* (work of) and continue by citing the craftsmen's first name, their professional titles, the *nisba* and blessings on them and their family and the believers. Such a regular pattern has not been found in any other group of signatures and therefore the identification of other families of craftsmen is impossible. Although the case of the Damghani craftsmen provides evidence concerning transmission of knowledge through family generations, it remains unclear to what extent this was the norm. The use of different professional titles, namely *muhandis*, *banna*' and *jassas*, likely reflects variegated tasks that the craftsmen were in charge of. Stuccos produced by members of the Damghani family are produced with the same artistic techniques, they display similar characteristics, and they mostly feature similar calligraphic styles and decorative iconography. Craftsmen's workshops were therefore repositories of stucco production know-how. Observations of the geographical distribution of artistic techniques in conjunction with studies of craftsmen's signatures can therefore aid in documenting workshops' mobility. Moreover, shared characteristics between different works make it possible to determine stuccoworks belonging to the same stucco workshops, even if they are not signed.⁸¹⁴

the portal stuccos may have been produced during the course of construction of the tower and that they thus pre-date the monumental inscriptions on the top of the tower.

⁸¹¹ See Blair 1982, 264. A photograph documenting the signature is stored in the Van Berchem archive (Photothèque Max Van Berchem), Inv. No. 434; http://www.epigraphie-islamique.org/epi/picture_view_full.php?ref=12392/image/1.jpg (Last Accessed: July 26, 2020).

⁸¹² Examination of the monument in February 2020 led to the documentation of two more signatures of the same workshop, in highly deteriorated state, on other parts of the monument: above the opening of the entrance portal and a small craftsman signature was spotted by Iman Aghajani at the end of the stucco inscription band of the ante-iwan of the monument. The mihrab signature is no longer extant. This research posits that the four signatures feature the signature of the same master craftsmen. They thus provide evidence of craftsmen's willingness to claim authorship of the monumental stucco programme; it also illustrates that craftsmen moved from one part of the monument to another to produce stuccos, rather than working on several surfaces in parallel. These stuccos have been interpreted as Ilkhanid by Hoseini and Shekofte; in his ongoing research, Aghajani proposes a mid-13th century date. Hoseini 2006, 41-71; Shekofte 2020, 101-122; Aghajani, Iman. "The Great Mosque of Faryūmad and its Inscriptions," (Article in preparation).

⁸¹³ The settlements of Bistam and Farumad were connected by one of the main communication routes in the Ilkhanid period which allowed for the transfer of artisans and artistic practices across the given geographical area.

⁸¹⁴ This research suggests that the carved stucco mihrabs of the Nushabad 'Ali mosque, the Miyandih mosque in Qamsar and the ruined mihrab in the north-western hall of the Kashan Friday are all works by the same workshop, based on their production technology, design principles and visual elements.

The Signatures of Marand and Urumiya Friday mosque Stucco Mihrabs – the Same Teacher?

Fig. 67.

The placement of craftsmen's signatures is not, however, necessarily a guarantee that a stucco work is the result of a single artistic intervention. The Urumiya Friday mosque mihrab (Cat. No. 23) illustrates craftsmen's versatility in restoring older stuccoworks; it remains unclear whether the dated signature on this mihrab is an original from 1277-78, or whether the mihrab could have been modified in the post-Ilkhanid period.⁸¹⁵ A similar signature on the Marand Friday mosque stucco mihrab (1330-31; Cat. No. 22) also contains the *nisba* Tabrizi. The craftsmen's signatures on these two mihrabs share some characteristics, including the forms of their lower interior niches, signatures' placement and the mihrab design. However, they exhibit different dimensions and proportions and the mihrabs were produced using differing stucco artistic techniques. This suggests that the two mihrabs are not attributable to the same workshop, but that the craftsmen responsible for the production of these mihrabs might have been taught by the same stucco master(s).⁸¹⁶

RELATED CRAFTSMEN SIGNATURES – NORTH-WESTERN IRAN

Urumiya Friday mosque, 1277 (?)

عمل عبد المؤمن بن شرفشاه النقاش التبریزی



Marand Friday mosque, 1330-31

عمل العبد الفقير نظام بندگان التبریزی



Figure 67: Comparison of Urumiya and Marand carved stucco mihrab craftsmen's signatures.

⁸¹⁵ Amir Hossein Karimy, personal communication to the author.

⁸¹⁶ At the present state of research, it is necessary to consider the possibility that the signature and date of the Urumiya mihrab could be a later copy of the original.

The Craftsmen's Signatures at Natanz and Mahallat-i Bala – Various Workshops

Fig. 68.

The 'Abd al-Samad shrine (Cat. No. 12) interior features a uniquely designed signature (1307-08), which traverses the capitals of the stucco inscription's supporting columns.⁸¹⁷ This suggests that craftsmen deliberately signed their works and that they often incorporated their signatures as an integral part of stucco programmes.⁸¹⁸ The stucco mihrab at Mahallat-i Bala (1335-36; 13)⁸¹⁹ is signed with the same name. But the characteristics of the stucco relief of this mihrab are significantly different from those at Natanz. It has been proposed that this could be the result of the master artisan growing old,⁸²⁰ although it is more plausible that the differences in relief plasticity between the two works stem from the different material properties of their stucco bodies.⁸²¹ The signature at Mahallat-i Bala demonstrates purposeful incorporation into the design of the stucco mihrab, because of its specific form and position in the mihrab's focal point. The stucco revetments of Natanz and Mahallat-i Bala were made using different production approaches (carving angle, stucco body preparation). It is likely that the same master craftsman employed different assistants for the production of these two stuccoworks.

RELATED CRAFTSMEN SIGNATURES – CENTRAL IRAN

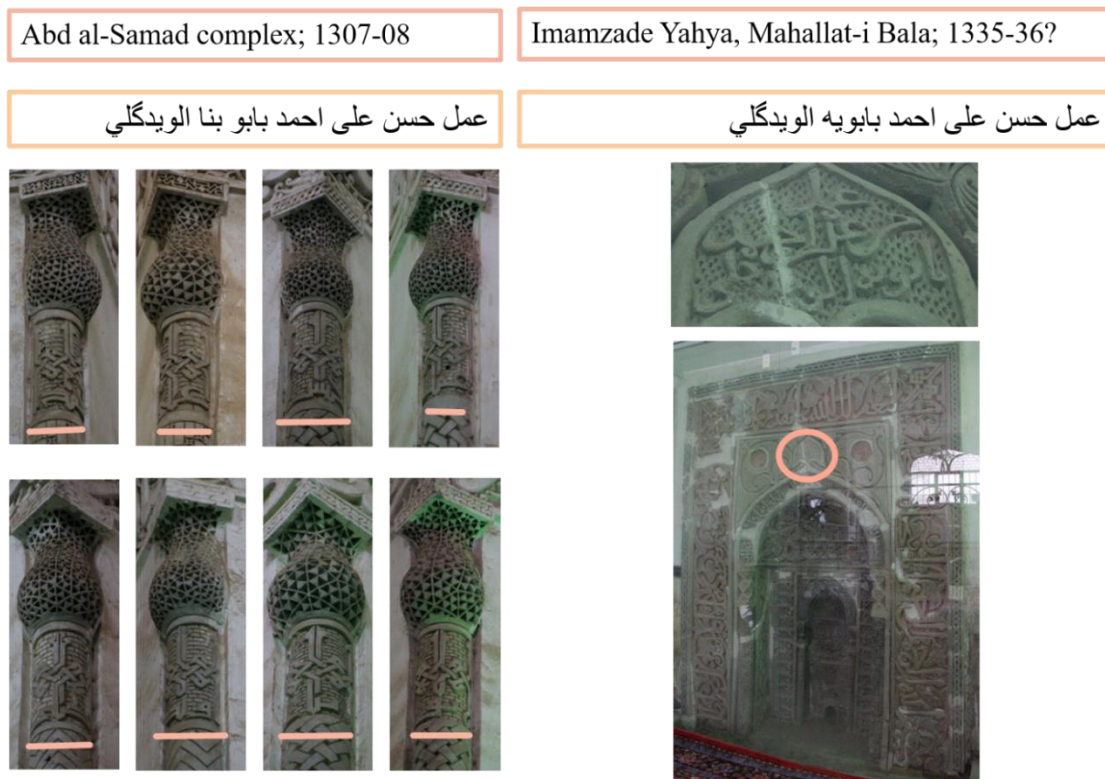


Figure 68: Repeating signatures of the same master stucco craftsman at Natanz and Mahallat-i Bala.

⁸¹⁷ McClary and Grbanovic 2021, 19.

⁸¹⁸ The signature is evenly divided for it to be featured on the determined number of column capitals supporting the dated inscription.

⁸¹⁹ This dating is proposed by Blair. Blair 1986b, 391.

⁸²⁰ *Ibid.*, 393.

⁸²¹ Moslem Mishmastnehi, personal communication to the author.

The congregational mosque of the Natanz complex contains a monumental stucco inscription band (1309-10) with another craftsman's signature. The tentative reading proposed by Blair can hardly be compared with the signature on the Uljaytu mihrab (Cat. No. 1).⁸²² The Ilkhanid stucco mihrab of the Kucha-yi Mir mosque at Natanz (see next paragraph) is signed *work of Haydar Kirmani*,⁸²³ and although its inscribed date is no longer legible, observations suggest that it was completed around 1320 (Cat. No. 31).⁸²⁴ These three distinct signatures in Natanz belong to three different stucco masters who each adopted distinct approaches to stucco production, which therefore impacted the heterogeneity of the visual characteristics of the stuccos they produced. These three signatures illustrate that the Ilkhanid stuccos at Natanz were produced by three different itinerant workshops rather than a single stationary, on-site team. This contrasts to Ilkhanid stuccos in the Bistam and Isfahan areas.

KIRMANI CRAFTSMEN SIGNATURES LOCATIONS



Figure 69: Comparison of signatures with Kirmani *nisba* stucco craftsmen's signatures.

Stucco Signatures with the Nisba Kirmani – Family Workshop or Coincidence?

Fig. 69.

Ground-breaking remarks concerning the Kirmani *nisba* stucco craftsmen's signatures are found in O'Kane.⁸²⁵ The Imamzada Rabi'a Khatun mihrab from Ushturjan (now in the National Archaeological Museum in Tehran; Cat. No. 32) is signed and dated in a manner similar to the

⁸²² Blair 1986a, 61.

⁸²³ O'Kane 1992, 87.

⁸²⁴ McClary and Grbanovic 2021, 9.

⁸²⁵ O'Kane 1992.

Kucha-yi Mir mosque mihrab (Cat. No. 31); the two cartouches on the sides of the internal niche feature the craftsman's signature and the date of the mihrab's completion.⁸²⁶ Further examples of the same modality of placing signatures can be found on the mihrab of the Kirmani mosque of the Turbat-i Jam complex (between 1312-13 and 1327-28; Cat. No. 30) and on the external mihrab of the same complex, both of which feature the same name. Another related stucco repertoire, which features a mihrab with fragmentary and illegible remains of a signature and date in two cartouches on the sides of its internal niche, is the little-known monument of Mir Zabir near Sirjan (early 14th century; Cat. No. 33). Its inscription is no longer extant, but Salihi, Taghavinejad and Rashidniya posit that this mihrab and its stuccos are the work of one family of craftsmen.⁸²⁷ Listed cases of stucco mihrabs with similar types of craftsmen's signatures and dates have however been signed by different stucco masters, which share the common *nisba*: *Kirmani*. Although there are some common visual characteristics among them - such as floral iconographic elements and palmette compositions - and they seem to have been produced with related stucco carving techniques, these stuccos are not similar enough to be irrefutably considered the work of a single Kirmani workshop.⁸²⁸ It is, however, plausible that the Kirmani stucco craftsmen could have been relatives and could have worked together at a certain point, resulting in similar characteristics of their artistic works.

Other Stuccoworks – Further Information on Craftsmen's Identities

Other variants in signature placement illustrate that this modality is an important characteristic of every stucco workshop. A group of stuccos produced during the third decorative stage (1312-13; Cat. No. 2) at the Pir-i Bakran mausoleum is signed *work of Muhammad Shah Naqqash*.⁸²⁹ The calligraphic quality of the inscription does not correspond to a signature written by a skilled calligrapher⁸³⁰ and is therefore probably the name of the master craftsman who bore an appellation such as *designer*, or *decorator*. The stuccos of Pir-i Bakran were produced using the same technology and contain epigraphic and ornamental iconography similar to the stuccos of the Haftshuya Friday mosque (c. 1310-16; Cat. No. 3). The two monuments contain isolated Square Kufic inscription panels, which required a special production and design approach. This evidence confirms that they are both works of the same workshop, despite the absence of a craftsman's signature at Haftshuya. Shared production technology, as well as epigraphic and ornamental iconography, suggest that the stuccos of the Friday mosque of Ushturjan (1315-16; Cat. No. 4), the Pir-i Bakran mausoleum (third phase, 1312-13), the Farfan Friday mosque (c. 1310-1320; Cat. No. 5) and the Haftshuya Friday mosque were likely the work of a single workshop, which operated in the greater Isfahan area.

Stemming from similarities in the production technology, as well as vegetal, geometric and epigraphic visual parallels and shared design traits, it is also plausible that two other unsigned mihrabs should be considered as works of the Damghani family; the almost undocumented stucco mihrab of the Jawin Friday mosque (Cat. No. 20) is preserved in a fragmentary state and has been registered as a work of the Seljuq period. More recent research presented in this work, and comparison of its stuccos with parallel works, reveals that it could be the work of a relative

⁸²⁶ See O'Kane 1992, 87.

⁸²⁷ Salihi, Rashidniya and Taghavinejad 2017, 19-32.

⁸²⁸ This interpretation has been suggested by Salihi, Taghavinejad and Rashidniya. See Salihi and Rashidniya 2016, 9-30; Salihi, Rashidniya and Taghavinejad 2018, 27-31.

⁸²⁹ Grbanovic 2017a, 68.

⁸³⁰ The identification of this signature with a historic manuscript calligrapher has been suggested by Blair. Blair 1986a, 39.

of the Damghani craftsmen family and may consequently date to the Ilkhanid period. The artistic techniques, approach to carving, and the geometric and vegetal ornamentation of this mihrab are reflected in the works of the Damghani family, but it does not retain a craftsman's signature.⁸³¹ The craftsmanship of the mihrab, especially that of its epigraphic elements, indicates a lower level of skill as compared to the works of Bistam and Damghan, suggesting that perhaps only some craftsmen from the Damghani family, or even disciples of theirs, were involved in the production of the Jawin mihrab.

Another lesser-known Ilkhanid stucco mihrab which features characteristics echoing the works of the Damghani family is located in Qala-yi Naw, some 17 km north-east of Bistam, in the Abu al-Hasan al-Kharaqani funerary complex (Cat. No. 21).⁸³² This is likely a remnant of a stucco programme which was originally larger and which reportedly dates from the period of Abu Sa'id's reign. The mihrab was produced with a selection of techniques and a carving style similar to the works of the Damghani family. Its elements of vegetal and geometric ornamentation find exact parallels in the mihrab of the Ilkhanid mosque of the Bayazid Bistami complex (dated 1299-1300; Cat. No. 19) and the stuccos of the seclusion rooms of the complex (1303) with the Damghani family signature (*'amal Muhammad ibn-i Husayn al-Damghani wa akhuhi Hajji*). This mihrab also features certain peculiarities, which do not relate to the Damghani works, including inscriptions exclusively in cursive script in which specific content relating to the identity of the person buried in the monument is written in Persian rather than Arabic. The slightly later (presumed) date of the work might indicate that a disciple of the Damghani family produced it.

4.3 *The Intellectual Process behind the Production of Carved Stucco Revetments*

a.) The System of Monument Patronage, Construction and Decoration – Hierarchy, Roles and Communication

Fig. 70.

Three main levels within the hierarchy of monument and revetment patronage and production have been discerned: the patron, the overseer and the architect, and builders and (stucco) craftsmen. The patron was essential for the commission; he was the person who provided the necessary financial resources for the construction of a monument and for its revetments. Patrons had different motivations behind the commission of monuments and stucco repertoires. These ambitions were manifested through the type of commission (monument foundation, monument redecoration) on a structure which retained a specific function (congregational mosque, pilgrimage complex, funerary structure, etc.). The choice of monument type for construction, repairs, redecoration, or enlargement already manifested the patron's political intentions and partially determined the meaning of the stuccos which were about to be produced. The patron decided who would be appointed as the overseer of the project, and this person, who was not an expert in monument construction or revetment production, was responsible for the performance of the project. It remains unclear whether some stuccos were produced in the context where the role of the overseer could have been played by the patron. The overseer therefore had to communicate closely with the patron concerning the envisioned monument and

⁸³¹ The closely related elements comprise the flower blossom rosettes and geometric patterns created with four-leaf clover-like ornaments. Further parallels include the use of applied moulded elements for its spandrels and the carving of stucco panels out of a single or multiple layers of stucco body.

⁸³² The mihrab has so far only received a brief mention in Hillenbrand 1971, 161.

with the selected architect (or master builder) who was in charge of the monument's design (plan, elevations, proportions), which had to include plans for the architectural revetment repertoire of the architectural structure. The architect was accordingly made aware of the patron's ambitions and had to prepare the monument design in communication with the patron and as determined by the size of the endowment made available for the project.

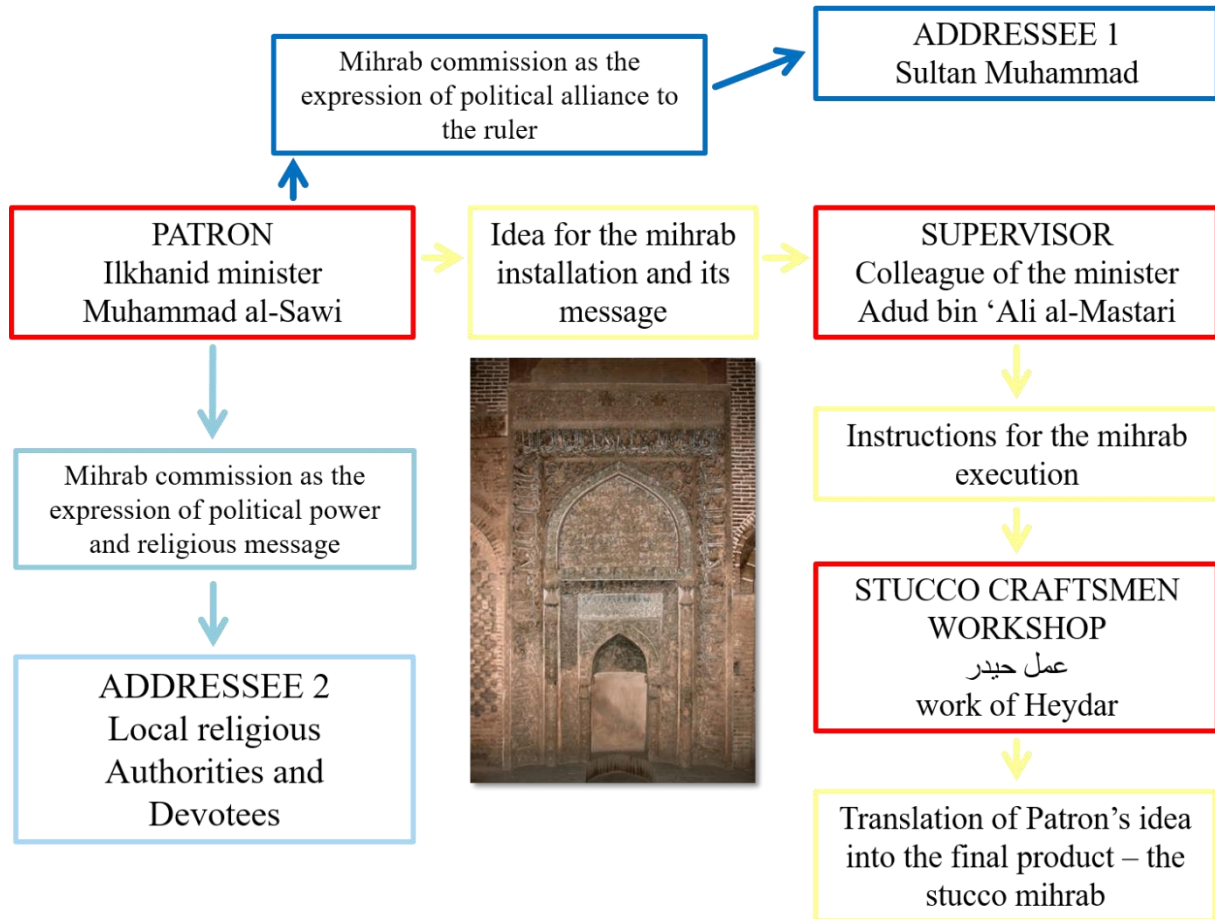


Figure 70: The mechanism behind the production of the Uljaytu mihrab in the Isfahan Friday mosque.

The architect prepared the design of the monument, which could include structural innovations or repeat the form of existing monuments. These plans had to include estimates of the amount of necessary construction material, information on experts involved, and the required labour. These plans had to be approved by the patron or in communication via the overseer before the monument construction began. They had to include at least general plans for architectural revetments pertaining to the monument, for two reasons. Firstly, the monument core structure had to be constructed in order for the production of revetments or their application on architectural surfaces to be performed.⁸³³ Secondly, the wall surface dimensions and proportions had to be calculated in order to accommodate the revetment panels.⁸³⁴ In doing so,

⁸³³ For some revetments, especially for carved stuccos of the Seljuq but also frequently the Ilkhanid period, the wall surfaces comprised special frames in forms of cartouches, which were formed by fired bricks to frame and structurally support the stuccos. This had to be planned out in advance and be taken into consideration during monument designing and construction of its core. One of the best visible such examples is the ruined portal of the *qibla iwan* of the Khusraw Shir Friday mosque (Cat. No. 17).

⁸³⁴ For carved stucco medium, the panels could be adjusted according to the space available, but this was more difficult for revetments which were prefabricated, such as applied moulded and stencilled stucco or tile mosaic.

the visually pleasing appearance of the monument structure and its revetments could be ensured. The architect was an expert in monument construction and the person was also likely well acquainted with different architectural revetment production technologies and on-site procedures. It was the task of the architect to communicate with master builders of construction crews and lead them in the process of monument construction and decoration. The craftsmen responsible for the revetments were already present at the construction sites and additionally aided the builders with the preparation of architectural surfaces for the revetment application process. It has also been shown that often, the craftsmen began to decorate the monuments as they were being constructed (see above).⁸³⁵

After having been engaged to produce a stucco revetment repertoire, the stucco master craftsmen prepared the stucco revetment designs with the aid of their workshop members and possibly external experts. They produced rough sketches and working drawings of the revetments, which served two purposes. They firstly had to communicate with the architect and the overseer concerning the characteristics of decorative repertoires. Secondly, there was a need to estimate the amount of the necessary material for the revetment production. These rough drawings also aided the craftsmen to prepare more detailed drawings of ornamentation and inscriptions which were used as guidance in the process of production (carving) of stucco revetments. This process had to include the decision making regarding the content of the revetments' epigraphic programme. The overseer or architect communicated the needs of the patron concerning the epigraphic programme content. This mainly concerned historic inscriptions and as shown, in some cases, specific Shi'ite and other religious inscriptions. This research has shown that for the religious inscriptions (such as Qur'anic excerpts), workshops seem to have had their repertoires of selected excerpts which they employed with a certain level of variation and also repetition for different stucco repertoires.⁸³⁶ Stucco craftsmen could have been aided in the preparation of epigraphic repertoires by external collaborators, such as chancellors or calligraphers, or even overseers.⁸³⁷ Once the preliminary plans and drawings of the revetments have been approved, and the material and work force gathered, the craftsmen could begin with the production of the stucco repertoire.

The process of production of stuccos and their final visual appearance, which also comprises elements and aspects of their meaning and function, can be divided into three stages regarding their design. After having prepared the coarse layers and support for the stucco revetments reliefs, the craftsmen began to outline the design for their inscriptions, vegetal ornamentation, and geometrical elements onto layers of fine stucco which were worked by the means of stucco material subtraction (carving) and addition (applied elements). Studies of the remains of stucco design traces, as indicated in Chapter 5 (Section 5.3), illustrate that similar to the architectural structures, stucco revetments were subjected to the process of development and modifications of the initial stucco revetment design into the final product. Moreover, the design which was initially outlined on the stucco surfaces was modified according to necessity during the stucco

⁸³⁵ The best example is provided by the Kashana funerary tower in Bistam and the adjacent Friday mosque (Cat. No. 18).

⁸³⁶ Compare epigraphic programmes of the Bistam Friday mosque stuccos (Cat. No. 18) with those of the Bayazid Bistami complex (Cat. No. 19). Both repertoires were produced by the same stucco craftsmen's family. Some parallels in choices of Qur'anic excerpts have also been documented for mihrabs signed by the Kirmani craftsmen; compare epigraphic programmes of the Kucha-yi Mir mosque in Natanz (Cat. No. 31) with the Imamzada Rabi'a Khatun mihrab from Ushturjan, (Cat. No. 32).

⁸³⁷ Perhaps the best example for the described procedures is the epigraphic programme of the Uljaytu mihrab at the Isfahan Friday mosque (Cat. No. 1).

carving procedure. It is apparent that initial designs were not always detailed and that they were intended to be made more detailed during stucco carving.⁸³⁸ In other cases, as discussed in detail in Chapter 5 (Section 5.3), craftsmen themselves modified the original designs and improved them depending on the context.⁸³⁹ Stucco revetment repertoires could undergo more significant changes of their initial design, which could include additions of several panels and enlargement of stucco repertoires.⁸⁴⁰ These types of changes were unlikely to affect the epigraphic programmes of the stucco repertoires. Their main function was that of the refinement of the stucco repertoires and their adjustment to the given architectural context. The described practice enabled for the final product of stucco to fit better in the monuments and to perform their function more effectively. It is thus the final product, the epigraphic repertoire, that provides evidence and information regarding the function and meaning of stuccos, as determined by the patron and materialized by the craftsmen.

The message conveyed by the stuccos can be divided into four main characteristics: form, epigraphic programme, visual appearance (aesthetics) and dimensions of stuccos (and other architectural revetments). Observations of the relation between the status of the patrons and the commissioned monuments suggest that the dimensions of the revetments and the entire revetment repertoire were significant in reflecting the status and the political power of the patrons. It has been shown in the monument discussion that there was rarely a perceivable difference in quality of production of stuccos between imperial commissions, those of Ilkhanid officials and patrons of lower status. The main difference concerns dimensions of monuments and the extent of the stucco repertoire. Large monuments with extensive repertoires in stucco and other media impressed the faithful and remained in their memory longer, compared to more modest repertoires. The form of the revetments was also significant in determining their function and meaning and conveying the message of the patron to the faithful. The best and the most evident example are stucco mihrabs. The form of the mihrabs and their location alone were recognizable to the visitors who came to the monuments. They indirectly highlighted the function of monuments and acted as one of the visual focal points of revetment repertoires and also as focal points of religious rites. Their sponsorship was thus of utmost significance and the prestige of such commissions was further highlighted by additional panels of stucco repertoires and other revetments which reflected the status of the patron. The aesthetic appearance or visual characteristics of these revetments functioned to bolster the impact of the monumental dimensions of the repertoires and to visually transform architectural revetments in the manner for the faithful to be visually and emotionally impressed by the aesthetic and sensory experience of the visit to public architectural spaces.

The epigraphic repertoire of the revetments conveyed the direct message of the patron and was formed and produced by craftsmen in communication with the overseers, the architect and perhaps the occasional aid of external experts (see Chapter 4; Section 4.3). The inscriptions which were included into epigraphic programmes of the stucco repertoires could have reflected the ambitions of the patrons behind the commission of monument construction and decoration. But further evidence is needed to confirm this speculation. In this respect, the historic inscriptions concerning the themes of patronage and identity of patrons were the most significant. The majority of these inscriptions was, as shown in this research, placed in locations

⁸³⁸ This is indicated by the design incision remains on the Marand Friday mosque stucco mihrab. See Cat. No. 22.

⁸³⁹ The best evidence is provided by the differences between the stucco relief and remains of their initial design on the mihrab of the Pir-i Bakran mausoleum. See Cat. No. 2.

⁸⁴⁰ See the discussion of the Haftshuya Friday mosque stucco mihrab, Cat. No. 3.

where they were well visible and which often presented focal points of revetment repertoires.⁸⁴¹ These inscriptions need to be understood in the context of the entire epigraphic repertoires and thus in conjunction with religious inscriptions among which the most frequent were invocations to God, selected Qur'anic excerpts, Hadiths and specific sectarian inscriptions (see Chapter 3, Section 3.3). Quantitative analysis concerning the occurrence and selection of Qur'anic excerpts revealed that in most cases, inscriptions for epigraphic repertoires were selected from a generic bulk of excerpts across the Iranian territory. Only occasionally, less frequently occurring Qur'anic excerpts were employed for epigraphic programmes in stucco. The research discerned several cases of stucco revetment repertoires where the epigraphic programme is more closely connected to the function of the monuments, their significance and to their patron. This indicates that in a limited number of cases, epigraphic repertoire of stuccos was more closely related to the monument and it more strongly reflected the patron's ambitions.

b.) Stucco Epigraphic Programmes and their Function and Meaning – Some Pieces of Evidence

The specific selection of the Qur'anic excerpts in relation to the monument function is well discernible from observations of occurrence of the Qur'anic excerpts from *Surat al-Jum'a* (chapter 62). Passages from this chapter have been documented in five epigraphic repertoires in carved stuccos, of which four are located in congregational mosques. The specific passages of the chapter (especially verses 9 and 10), which refer to the significance of the performance of the Friday prayer were chosen for the stuccos in order to highlight the function of these monuments. The most important of these examples is the inscription of the verse 9 of the *Sura*, at the no longer extant monumental carved stucco mihrab of the Kashan Friday mosque.⁸⁴² The inscription band was designed in a manner for the word *Friday* to coincide with the exact middle of the band forming the monumental trefoil arch of the mihrab. Stucco craftsmen therefore designed the mihrab and its epigraphic programme for a specific monument with the aim of highlighting its function in the epigraphic repertoire.

An important example is presented by the stucco mihrab of the Kharaqani complex at Qala-yi Naw (Cat. No. 21). This monument formed around the tomb of the revered Sufi mystic Abu al-Hasan al-Kharaqani; through the centuries it evolved into a pilgrimage funerary complex with the shrine of the Shaykh and architectural space for prayer and perhaps other no longer extant structures. The complex was probably decorated in the Late Ilkhanid period, with a stucco mihrab, which originally presented the focal point of a perhaps more extensive stucco repertoire. This mihrab comprises an epigraphic repertoire consisting of a short Prophetic Hadith and a large framing band with an inscription in Persian language recounting one of the mystical poems of the Sufi master buried in the complex.⁸⁴³ This is an exceptional case and no other such inscriptions have been recorded on Ilkhanid stuccos. This inscription was therefore chosen on purpose for the mihrab to reflect the meaning and function of the complex where the stucco repertoire was being installed. This illustrates that the stucco revetment programme design was specifically prepared and produced for the monument under investigation.

⁸⁴¹ The best examples are presented by the historic inscriptions incorporated into mihrabs, such as the mihrab of the Marand Friday mosque (Cat. No. 22) and the Uljaytu mihrab at the Isfahan Friday mosque (Cat. No. 1).

⁸⁴² The dating of this two-layered mihrab requires scientific evidence to establish whether it is work of Seljuq or Ilkhanid craftsmen.

⁸⁴³ Another smaller framing band seems to comprise a Qur'anic excerpt from *Surat al-Hashr*. Iman Aghajani, personal communication to the author.

Another curious example of the relation between the epigraphic programme in carved stucco and the monument's function and meaning is presented by the Khizr mausoleum at Hamadan (Cat. No. 37). This research of the monument has shown that it originally assumed the form of a Sufi complex, which consisted of a *khanqah*, the mausoleum of the Shaykh and perhaps other structures. The interior of the modest mausoleum retains fragments of a stucco revetment repertoire, which the research revealed was partially redecorated and repaired sometime in the modern period. The unique aspect of the repertoire are its monumental inscription bands on supporting walls which comprise excerpts from the *Shahnama*. Although the *Shahnama* excerpts have been frequently employed for Ilkhanid lustre tile revetments, the Khizr mausoleum presents the only case of such excerpts in carved stucco. No solid evidence for the interpretation of the presence of these excerpts has so far been gathered, but it has been proposed that the excerpts either reflect the Sufi function of the monument or that they could be connected to the theme of kingship of either the patron or the real identity of the person for whom the mausoleum was built in the pre-Ilkhanid period. The inscription content has therefore been selected in strong relation to the function and meaning of the monument and could have also been connected to its patronage. Moreover, it was prepared at the time of the monument decoration specifically for the structure in question. The patron or the person in charge of the monument redecoration likely impacted the choice of the specific content for the repertoire's inscriptions.

Stucco Patronage and the Uljaytu Mihrab – the Determination of its Function and Meaning

Perhaps the most significant example which illustrates the connection between the stucco repertoire's epigraphic programme and the patron is the Uljaytu mihrab in the Isfahan Friday mosque (Cat. No. 1). A closer look at the content of its epigraphic programme, location of inscriptions, their form and other visual characteristics, reveals a masterly composed epigraphic programme of the mihrab connected to the themes of patronage and religious message. The mihrab is however an exceptional case which is of the utmost use for the understanding of the intellectual mechanism behind production of stuccos, but it should not be considered as a rule for the Ilkhanid stucco repertoires.

The content of the Uljaytu mihrab inscriptions can be divided into two main categories: historic inscription and religious texts. The content of religious inscriptions is different from most of the Ilkhanid stucco repertoires. In place of the usual Qur'anic verses, the mihrab contains two Hadiths.⁸⁴⁴ The Shi'ite *Shahada* and invocations to God are also featured on the mihrab. These inscriptions are produced in a variety of inscription styles of exceptional calligraphic quality (in terms of script fluency, proportion and form elaboration) ranging from *Thuluth* and *Naskh* to Kufic styles. It seems that the most significant inscriptions of the epigraphic repertoire were designed in *Thuluth* style. All inscriptions contain diacritical marks, but they are only occasionally vocalized.⁸⁴⁵ The choice of calligraphic styles and employment of diacritical marks reflect the craftsmen's will to render the epigraphic repertoire as legible as possible, for the literate audience. This visibility of inscriptions, which also eased their reading, was

⁸⁴⁴ Hadiths have also been documented on the Abu al-Hasan al-Kharaqani mihrab at Qala-yi Naw (Cat. No. 21), the Marand Friday mosque mihrab (Cat. No. 22) and the stuccos of the Farumad Friday mosque mihrab (Cat. No. 19).

⁸⁴⁵ The presence of diacritical marks on these inscriptions is significant and not frequent in Ilkhanid stucco repertoires.

accentuated with the gilding of the inscriptions, which were set against a darker coloured background of blue and floral scrolls.

The mihrab's epigraphic programme is the essential element for the interpretation of its meaning and function.⁸⁴⁶ Similar to the division of the content of these inscriptions was also the scholarly focus at discussing the epigraphic programme. Historians mainly focused on the central lunette historic inscription, which remains one of the most significant historic pieces of evidence regarding Uljaytu's conversion to the Shi'ite faith. Art historians similarly recognised the importance of the mihrab in illustrating Uljaytu's conversion and lauded the quality of the epigraphic programme, especially of the exterior framing inscription. The question of the mihrab's patronage, its actual patron, and evidence regarding the role divisions at construction sites for production of stucco revetments were overshadowed by the outlined discourse.

Observations of the mihrab's colour scheme and the relationship between the inscription content in their polychrome setting in fact point towards the existence of an inscription hierarchy, which was strengthened by its polychromy scheme. This leads to the suggestion that the combination of silver and gold leaf application for the historic inscription in the mihrab's lunette served to corroborate the mihrab's primary message, which was the statement regarding its patronage and political alliance via the mihrab installation. Furthermore, the framing of the Hadith inscription with content related to the monument patronage, which promises an award for the generous patrons in their afterlife, is emphasized with silver leaf application. Shi'ite inscriptions of the mihrab were rendered polychrome, but less visible with less precious pigments of green and ochre colours, and were therefore assigned the secondary place in the importance hierarchy and visibility of the mihrab's epigraphic programme, which determined its meaning. The function and meaning of the Uljaytu mihrab should thus be understood as the expression and willingness of an assertion of political power through architectural and artistic patronage. The mihrab's secondary meaning relating to the change of the state creed to Shi'ite was certainly part of the communication, which the mihrab was supposed to convey to the faithful, but it has been over-interpreted by the scholars to the point that it rather erroneously resulted as the mihrab's main meaning. In sum, the primary message, dictated by the will and intentions of the endower in sponsoring the Uljaytu mihrab was that of patronage, which consolidated the political alliance with the ruler of the Empire. The mihrab's religious content was therefore secondary and perhaps more important for the visitors to the prayer space and for the local religious authorities.

4.4 Stucco Craftsmen Workshops' Mobility (Were stucco craftsmen's workshops organized into schools?)

Background

Scholars, above all Raya Shani, propose that builders and stucco craftsmen of the Seljuq period were organized into regional schools, which built monuments or produced stucco revetments; for example: the School of Kashan, Qazvin, Isfahan and Khurasan.⁸⁴⁷ This *stucco school*

⁸⁴⁶ For the discussion of the relationship between the organization of epigraphic programmes of monuments and the relation between the content of inscription and monument function, see Necipoğlu's discussions of Ottoman monuments. Necipoğlu 2005.

⁸⁴⁷ See Shani 1989; Shani 1997.

concept was developed through observations and comparison of ornamental elements of stucco revetments in the area of Kashan. The concept was also employed by Wilber, Hillenbrand and Pope, and it is reflected in the *Survey of Persian Art*.⁸⁴⁸ Shani suggests that stucco craftsmen were organized into groups which worked on a regional level and that the limits of their movement, as determined by the regions, limited the spread of stuccos featuring distinct styles.⁸⁴⁹ Shani almost entirely disregards the role of the stucco production technology and know-how and stucco material properties in determining the aesthetic appearance of stuccos and consequently their visual style. The employed methodology of stylistic and iconographic comparison of stuccos does not consider evidence provided by an analysis of the stucco production process, composition of workshops, their signatures, evidence of craftsmen's mobility and epigraphic repertoire differences.

None of the scholars attempted to clearly define what exactly the expression *school* means. From their discussion, it is evident that the employed concept of school means groups of craftsmen who operated in one regional unit and who produced stuccos of similar visual appearance and thus of the same or similar visual style. It is not clear if scholars believe this to be the result of a centralized system of stucco art practice or if they simply assume that stuccos produced by different workshops in one geographical unit were of similar appearance due to the circulation of the artistic ideas and knowledge. If so, they do not propose a mechanism for how the exchange of knowledge between different craftsmen's groups occurred and via which medium it was performed. As the discussion of monuments in this research work illustrates, the stuccos of regional areas differ in the manner in which they are produced, which was determined by the workshops which produced them. Each workshop was a repository of knowledge of stucco production and possessed its own ways, artistic techniques and approaches to stucco production, which manifested themselves in the final products by impacting the visual appearance of the stuccos. Exchange of this knowledge occurred on joint projects of more than one workshop or through apprenticeship, but it does not seem to have been centralized by a system tied to the administration and apparatus of the Ilkhanid Empire.

The concept of a royal atelier or a workshop, which paves the way to understanding especially the book arts cannot be employed in the case of carved stucco decorative medium and the majority of architectural revetment media of the Ilkhanid period for several reasons. This research demonstrates that stucco craftsmen's workshops were normally summoned to the sites for the purpose of stucco production. It has also been shown that workshops produced stucco revetments as determined by the dimensions of the endowment and that thus there was no difference in stucco quality between commissions by patrons of higher social status and those of lower status. The difference was that of dimensions and the extent of the produced stucco revetment programme rather than quality.⁸⁵⁰ Only in some cases, stuccos reveal a lesser production skill, which could be termed *provincial*.⁸⁵¹ Stucco workshops had to be mobile and

⁸⁴⁸ See Wilber 1955, 88-94; Hillenbrand 1971; Hillenbrand 1972; Hillenbrand 1975; Hillenbrand 1976a; Hillenbrand 1985; Pope 1934; Pope and Ackermann 1977[1938-39], Vol. 3, 1291-1321. Compare to Grbanovic 2020, 607-608, 613.

⁸⁴⁹ Shani 1989.

⁸⁵⁰ Compare stuccoworks of the Kashan Friday mosque, the Nushabad 'Ali mosque and the Miyandih mosque in Qamsar. These stuccos are works of the same workshop, but they differ considerably in their dimensions and location (type of monument and its significance). This could have been determined by the social statuses of their anonymous commissioners.

⁸⁵¹ Such as the mihrab of the Kuhpaya Friday mosque (Cat. No. 8), the Ilkhanid stuccos of the Zavara Pa Minar mosque (Cat. No. 6), the mihrab of the Jawin Friday mosque (Cat. No. 20) and the mausoleum of Khizr at Hamadan (Cat. No. 37).

with their mobility the types of stucco revetments which they produced would spread geographically. This research hypothesizes that the majority of stucco workshops operated on a regional level, perhaps because there was a sufficient number of commissions (see below). There are however several cases where craftsmen were mobilized long-distance, above all for imperial commissions. These patterns of craftsmen's mobility, described below, contradict the concept of a regional school, which can perhaps be employed for builders' groups, but not for makers of Ilkhanid architectural revetments and stuccos.

a.) Ilkhanid Stuccos through Time and Space

Fig. 71.

Ilkhanid stucco examination should be combined with research on stucco designs and artistic techniques and monument distribution, to provide new information to understand the stucco production processes, and the spread and transfer of stucco artistic techniques through stucco craftsmen's mobility. Hypothetically, stucco artistic techniques required specialised production knowledge which determined the aesthetic appearance and style of stuccos. Different types of this know-how were possessed by stucco craftsmen's workshops which determined the spread of stucco artistic techniques with their mobility for diverse commissions.

Examinations of geometric ornamentation on the Na'in Friday mosque stuccos (late 10th century) reveal traces of circular incisions produced with compass-like tools. A paper sketch may only have served an indicative purpose for artisans in the creation of a design directly on the stucco surface. Direct design incision was an essential part of the stucco production procedure because of the difference in scale between a paper sketch and a stucco surface. The muqarnas design slab discovered at Takht-i Sulayman⁸⁵² indicates that revetment designs could be sketched on gypsum slabs instead of paper. Direct incisions of inscriptions and floral scrolls on stuccos at the Ribat-i Sharaf caravanserai (imperial refurbishment: 1154) demonstrate that the decorative programme was first incised on the stucco surface and subsequently carved. Frieze fragments from the Tappa Madrasa in Nishapur (last quarter of 11th century, the Met, Inv. Nos. 39.40.58, 39.40.60-64)⁸⁵³ contain the free-hand design incisions in place of stencilled outlines, similar to traces on the two carved stucco inscriptions (1308-1309) on Bistam's Kashana tomb tower (Cat. No. 18). Stucco and terracotta revetments therefore had a partially shared design production process. These selected examples illustrate a long-standing tradition of revetment design preparation, which was inherited by the Ilkhanid craftsmen.

This research documents design outline traces for stucco carving on approximately twenty Ilkhanid monuments, comprising: red and black outlines, direct incisions, gridlines and baselines. Extensive evidence from a large geographical unit confirms that this was the most widespread approach to stucco designing. In contrast, Ilkhanid wall paintings reveal two design approaches: use of compass and ruler for basic space divisions and positioning, and the use of stencils and direct incisions for wall painting design production. Repeating inscriptions on wall paintings (2nd decorative phase) in the Uljaytu mausoleum at Sultaniyya (1st decorative phase: 1305-1310; 2nd decorative phase: 1313-1316/20; Cat. No. 27) confirm the use of stencils for their design, similar to the wall paintings (1325) on the Rukniyya complex in Yazd (Cat. No. 29). Incised wall painting inscriptions are documented at the Baba 'Abdullah mosque and mausoleum (1300-1301; wall painting redecoration 1336-1337; Cat. No. 9) in Na'in and the

⁸⁵² Yaghan 2000.

⁸⁵³ <https://www.metmuseum.org/art/collection/search#!?q=39.40.63> (Last Accessed: February 9, 2021).

Qadamqah at Farasha (1193-1194; 1296-1297; wall paintings: 1300-1301?). Revetments on the Madrasa Shamsiyya at Yazd (1329-1330; 1365?; Cat. No. 29) indicate that use of compasses and lining were also indispensable for the applied moulded and stencilled stucco techniques.⁸⁵⁴

Further material evidence of stucco craftsmen's on-site procedures is found on further examples of Ilkhanid stuccos. The Marand Friday mosque mihrab (1330-1331; Cat. No. 22) contains traces of the mihrab design incisions and ruling; in this case, the final mihrab design was incised directly on the mihrab's surface by the craftsmen. The remaining outer boundaries of these ruling incisions point towards the indicative nature of the mihrab preparation sketches and rule out the possibility of stencil use. Red outlines and incisions visible on damaged parts of the Sujas Friday mosque (2nd decorative phase; late 13th century; Cat. No. 35) and the Abarquh Friday mosque (1338; Cat. No. 10) mihrabs exemplify the use of red colour outlines for stuccos carved out of several gypsum layers. Ruling and outline incisions for inscriptions are also found on stuccos scattered across a wider geographical unit and a longer chronological span: the Ushturjan Imamzada Rabi'a Khatun mihrab (1308-09; National Archaeological Museum Teheran; Cat. No. 32) at the Qum mausolea stuccos (e. g. the Gunbad-i Sabz mausoleum, c. 1330; the 'Ali Safi mausoleum, 1359-1360, Cat. No. 15), at the Baba Luqman mausoleum in Sarakhs (1356), at the Farumad Friday mosque (Cat. No. 16) and at the Turbat-i Shaykh-i Jam complex (Old mosque; c. 1327-1328, Cat. No. 30).



Figure 71: Examples of use of gridlines for Square Kufic inscription design transfer into carved stucco medium (left: the Pir-i Bakran mausoleum; right: the Haftshuya Friday mosque mihrab).

⁸⁵⁴ See Alvandiyani 2010.

These design creation methods exhibit a common approach to stucco production which stems from the long-standing tradition of Iranian stucco crafts dating to at least the Sassanid era.⁸⁵⁵ This knowledge spread geographically through mobility of stucco craftsmen and chronologically by the means of know-how inheritance across generations of craftsmen. Stuccos encompass a multitude of artistic techniques and, accordingly, diverse approaches to stucco design transfer. Red outlines also served to outline designs for different techniques, such as applied moulded and stencilled stuccos at the Ushturjan Friday mosque mihrab (Cat. No. 4).⁸⁵⁶ Imperfections in Ilkhanid stucco inscription layout (incomplete, compressed inscriptions) provide further evidence against stencil use in their production. Observations of the Pir-i Bakran mausoleum inscriptions (2nd phase: 1303-1304; 3rd phase: 1312-1313; Cat. No. 2) suggest that their designs were performed directly on the stucco surface. The historic stucco *Thuluth* inscription in the burial chamber was produced first and the Qur'anic verse was subsequently used as a space-filler; it was not completed when the artist ran out of space. Other stucco craftsmen at Pir-i Bakran and the Isfahan Friday mosque, when running out of space due to a lack of exact planning, squeezed the remaining parts of Qur'anic verses next to inscriptions. Square Kufic and *Khatt-i Banna'i* inscriptions had to be transferred from a detailed drawing to the stucco surface with the aid of gridlines; their sketches were likely similar to those found on the Topkapı scroll.⁸⁵⁷

In sum, most stucco techniques required the design to be incised or outlined directly onto the stucco surface prior to its carving. Heads of the stucco workshops probably possessed advanced calligraphic and designing skills to outline the stucco design. Because stuccos had to be produced in segments (similar to *giornatas* or *Tageswerk*) due to the stucco drying, their designers had to be present on site throughout the stucco production process. Paper thus assumed a basic role in the preliminary design sketch phase; it was not used for the transfer of designs, unlike in the pouncing or dust sprinkling design transfer techniques frequently employed for wall paintings. Each stucco technique required a different design creation, transfer and production method, which had to be mastered separately through apprenticeship. Geographical distribution of these artistic techniques, tentatively combined with studies of craftsmen's signatures, can thus point towards the mobility of stucco craftsmen's workshops and transfer of artistic knowledge via communication routes.

b.) Stucco Artistic Techniques and Craftsmen's Mobility

Research into the geographical distribution of stucco techniques offers further information about the mobility of craftsmen. Distinct artistic techniques required specialised knowledge for the production of stuccos; the aesthetics of the stucco style result from the craftsmen's skills of stucco preparation, design and carving. Protruding stucco reliefs are found in all parts of Iran because this was a common skill during the Ilkhanid period. Particular types of stucco composition and specific artistic techniques were required for stuccos with deep reliefs and undercutting; they are mainly found in central Iran due to the partial limitation of the circulation of this skill. Circular bosses and applied protruding elements are found on a handful of monuments with an even geographical distribution. Building on extant wall painting repertoires, the main Ilkhanid wall painting production centre could have stretched between

⁸⁵⁵ Such design incision traces were documented during the 2020 field research in Iran on stucco repertoires of the Tappa Mil and especially the stuccos of Dargaz Bandian. In these cases incision lines are employed for repeating vegetal or geometric designs. Field research of stuccos by the author.

⁸⁵⁶ See Alvandian 2010, 160.

⁸⁵⁷ Necipoğlu and Al-Asad 1995, 29-40, 111-124, 231-232, 314-315.

Yazd, Abarquh and Na'in, but geographically isolated cases of Ilkhanid wall paintings are found in Isfahan, Sultaniyya and Turbat-i Jam, because craftsmen were assembled for specific commissions.⁸⁵⁸ The applied moulded and stencilled stucco techniques production centre was the Yazd area, but this particular revetment type has been documented twice in Isfahan (at Ushturjan and Pir-i Bakran) and once at Sultaniyya (Uljaytu mausoleum), which suggests a migration of artistic knowledge via craftsmen's mobility.

The combination of stucco artistic techniques and carving approaches determined the stucco design and aesthetics; instances of combinations of these approaches also illustrate workshop mobility. Seljuq stuccos at Qurva, Sujas (cat. No. 35) and Takistan seem to be works of the same team.⁸⁵⁹ Seljuq stuccos of the Ardistan Friday mosque (pre-Seljuq; Seljuq modifications 1058-1060) and the Dashti Friday mosque in Ardistan reveal the same production techniques and stucco designs, and they were likely the work of the same workshop. Similar cases are found for Ilkhanid stuccos such as the parallels between the Turbat-i Jam (Cat. No. 30) and Kucha-yi Mir (Cat. No. 31) mosques' mihrabs; they share the same craftsmen's *nisbas*, similar ornamentation repertoires and stucco carving approach.⁸⁶⁰ The Azadan Friday mosque north-west of Isfahan (14th c.) and the Pir-i Bakran mausoleum wall paintings (3rd phase: 1312-1313; Cat. No. 2) are isolated examples of depictions of religious landscapes in the Isfahan region. Stuccos of the third intervention at Pir-i Bakran (1312-1313) share carving, perforation, and design traits with the Haftshuya mosque mihrab (Cat. No. 3) and were probably works of the same workshop.

In sum, information about regional occurrences of revetment media and stucco techniques reveals two types of craftsmen's mobility: short-distance mobility mirrored in geographical areas with similar stucco production knowledge and aesthetics, and long-distance mobility to undertake more prominent commissions. Ilkhanid stucco workshops' mobility could be regional or trans-regional and it was not confined within the boundaries of regional schools. This itinerant nature of workshops did not exist on its own and was likely conditioned by patrons who assembled teams of specialised craftsmen from different regions to collaborate on specific commissions. The perceived regional style of stuccos is only apparent, and it was impacted by the locally available materials. Different compositional characteristics of material determined the choice of production techniques and the final aesthetic appearance of stuccos.

c.) The Uljaytu Mausoleum at Sultaniyya – the Generator of Craftsmen's Knowledge and Mobility

Fig. 72.

Research of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) provides for a unique existing example of a monumental architectural commission at which its function as a generator of craftsmen's and builders' knowledge and its subsequent geographical spread become visible. This imperial commission for construction and decoration of a monumental mausoleum complex of unprecedented dimensions was envisioned in the context of construction of the new Ilkhanid capital, which comprised other large dimension monuments, such as the citadel, the Friday mosque and the necessary infrastructure.⁸⁶¹ This study of the mausoleum of Uljaytu at

⁸⁵⁸ One should consider the possibility of the high rate of loss of wall paintings. Lorenz Korn, personal communication to the author. The presented assumptions thus need to be comprehended in an indicative manner.

⁸⁵⁹ See also Hillenbrand 1972; Hillenbrand 1975.

⁸⁶⁰ See O'Kane 1992.

⁸⁶¹ See Naiemi 2020.

Sultaniyya, provides for an insight into characteristics of the monument's structure and its revetment repertoire (produced in two phases) of extensive dimensions, which were produced in the early fourteenth century. An extensive number of different groups (workshops) of builders and craftsmen had to be summoned to Sultaniyya for the construction and decoration of the mausoleum, the citadel and the congregational mosque, together with other minor monuments.⁸⁶²

The mausoleum first had to be designed. As this research indicates, a specific type of construction method and solution were put in place in order for the builders to be able to construct a mausoleum of extensive dimensions, which was covered by a monumental double shell dome structure.⁸⁶³ This required the design of the monument to be planned well in advance, to agree upon it with the patron, to estimate the costs of labour and construction material and to summon the necessary experts. Two layers of architectural revetments were produced for the mausoleum's interior and they required diverse expertise and thus different craftsmen's workshops. The first phase of the decorations in glazed and terracotta elements revetments was produced sometime between 1305 and 1310.⁸⁶⁴ The second phase comprised production of wall paintings and applied moulded and stencilled stuccos, which required entirely different revetment technology and which were produced around 1313-1316/20.⁸⁶⁵ This research demonstrates that there was no real break between these two phases, because the same scaffolding was employed for production of both layers of revetments and the fact that the revetments of the first phase were never completed.

Historic inscriptions on the monument allow the establishment of the general chronological context for the production of the two repertoires. Comparison of designs, decorative patterns, and revetment production technology and comparison of dates of the monuments, enable the proposition of where the craftsmen had migrated to upon the production of revetments at Sultaniyya. Their origin however remains difficult to pinpoint; the craftsmen responsible for the first decorative phase are likely to have arrived from Tabriz.⁸⁶⁶ It is also plausible that these artisans were gathered from different parts of the Ilkhanid Empire, or even from abroad.⁸⁶⁷ None of the works at Sultaniyya retain a craftsman's signature which could point towards their origin or destination upon the completion of the revetments. They thus have to be traced based on employed artistic techniques, revetment production technology and designs. The large surfaces of the interior of the Uljaytu mausoleum required extensive amounts of revetments to be produced. This required teamwork of several craftsmen's workshops, gathered in order to work on a monument of extraordinary dimensions. The environment of the teamwork of different workshops fostered knowledge exchange of revetment production technology, designs and artistic techniques. Additional input might have been given by external collaborators, such as manuscript calligraphers and illuminators, who might have been summoned to aid the design of the revetments for the royal mausoleum. The construction and revetment production site of the mausoleum therefore functioned as a generator of exchange of artistic knowledge and know-

⁸⁶² Little can be said about the congregational mosque, but the citadel and especially the Uljaytu mausoleum discussion allow the proposition of some important observations.

⁸⁶³ See also Brambilla 2012; Brambilla 2019; Blair 2016, 112-171.

⁸⁶⁴ For the most up to date discussion and further bibliography concerning the question of the two decorative phases of the mausoleum, see Blair 2014, 112-171. For further information, see Cat. No. 27.

⁸⁶⁵ *Ibid.*

⁸⁶⁶ This is indicated in the *nisba* of the double craftsmen signature on the main portal of the Ushturjan Friday mosque (Cat. No. 4), which was most likely work of these craftsmen, after the conclusion of works at Sultaniyya.

⁸⁶⁷ Naiemi 2020, 4.

how in the period of the first and the second decorative stages. The craftsmen who participated in the projects were transformed by the experience of producing these large scale and innovative revetment repertoires: they gained new knowledge of artistic techniques, designs, approaches to production of revetments, etc. They put into practice and transferred the acquired knowledge in projects, which they joined after the conclusion of works at Sultaniyya.

Research of the monuments presented in this work pinpoints monuments where the craftsmen worked after the completion of the projects at Sultaniyya. They could be located based on the employed artistic techniques and visual characteristics of revetments such as their ornamentation, geometrical design, and vegetal motifs. The monuments with revetments for which the connection to Sultaniyya has been established almost entirely post-date the two decorative phases at the Uljaytu mausoleum, indicating that these monuments were destination and not origin of craftsmen who worked at the Uljaytu mausoleum.



Figure 72: Hypothetical routes of craftsmen's mobility for production of the two architectural revetment repertoires at Uljaytu mausoleum in Sultaniyya. The craftsmen of the first decorative stage likely originated from Tabriz and moved to Varamin, Natanz and Ushturjan, after the completion of the first decorative stage of the mausoleum, for new commissions. The craftsmen of the second decorative stage migrated to Ushturjan, Pir-i Bakran and ultimately Yazd, after the completion of mausoleum's second decorative stage.

For the first decorative phase at Sultaniyya, craftsmen needed to possess skills, know-how and expertise for production of glazed and terracotta revetments. Designs and production technology related to the Uljaytu mausoleum first phase revetments (1305-06 to 1310?) have been documented at the Varamin Friday mosque entrance portal and the domed prayer hall (1322-1325; Cat. No. 28), at the Imamzada Shah Husayn in Varamin (c. 1320; see Cat. No. 28), at the entrance portal of the no longer extant *khanqah* of the Natanz complex (1315-16; Cat.

No. 12) and at the northern entrance portal of the Ushturjan Friday mosque (1315-16; Cat. No. 4). The relationship between these decorative repertoires and those at Sultaniyya is extremely close from the point of view of employed artistic techniques, produced designs, and ornamental patterns. The relationship is so strong that these repertoires must be works of the same craftsmen.⁸⁶⁸ It is thus possible to conclude that upon the interruption of the first decorative phase at Sultaniyya, the craftsmen migrated towards Varamin, Natanz and Ushturjan. They spread the acquired knowledge for the production of revetments for smaller dimension monuments and they further developed and improved it.

The second decorative phase at the Sultaniyya mausoleum was produced in wall painting and applied moulded and stencilled stuccos. It also comprised tile mosaic and some carved stuccos. Its production was performed from around 1313-14 and until 1316 or up to 1320. As in the first decorative phase, the comparison and studies of monuments located buildings with revetments related to the Uljaytu mausoleum at Sultaniyya, which were likely works of the same craftsmen's workshops: the Pir-i Bakran mausoleum south of Isfahan (revetments dated 1312-13 or later; Cat. No. 2), the Ushturjan Friday mosque (revetments which post-date 1315-16 and were likely a redecoration of the mosque's mihrab; Cat. No. 4), the Rukniyya complex in Yazd (1325; Cat. No. 29) and the Shamsiyya complex in Yazd (1335 or later; Cat. No. 29). The earlier dated wall paintings in the monuments located between Abarquh, Yazd and Na'in might indicate that the craftsmen responsible for the production of the second decorative layer of the Uljaytu mausoleum could have originated from central Iran. The revetments at Pir-i Bakran, Ushturjan, and Rukniyya and Shamsiyya, and some indications in the written sources⁸⁶⁹ of the period, indicate that upon the completion of the second decorative stage at Sultaniyya, craftsmen migrated to the area of the Muzaffarid territory and worked on monuments there. The craftsmen therefore migrated from north-western to central and southern areas of Iran.

To summarize, for the production of revetments of the Uljaytu mausoleum at Sultaniyya and likely of other structures in the new capital, craftsmen were gathered from diverse regions of the Empire's territory. The collaboration of the craftsmen in the completion of the revetments for the mausoleum fostered an exchange of knowledge, their training, and apprenticeship to accelerate and invent new artistic techniques and specific solutions which enabled the production of revetments for the mausoleum. This imperial commission therefore impacted the development of the revetment technology and training of skilled experts for this purpose. Upon the completion of the two phases of revetments at the mausoleum, craftsmen migrated for other commissions to work on monuments in Varamin, Natanz, Ushturjan, Pir-i Bakran and the area of Yazd. Both, the summoning of craftsmen for work at Sultaniyya and their migration to new construction sites upon the completion of tasks at Sultaniyya, involved trans-regional craftsmen's mobility of considerable distances.⁸⁷⁰ The listed mobility distances are considerably longer, compared to the regional mobility of stucco craftsmen's workshops, which has been demonstrated in this research and amounts to the maximum of something below four hundred kilometres. It is thus necessary to comprehend the works at the Uljaytu mausoleum as

⁸⁶⁸ Research by the author. See the discussions in Cat. Nos. 2, 4, 27, 28 and 29.

⁸⁶⁹ Blair 1986a, 33.

⁸⁷⁰ As the crow flies the distances between these monuments are the following: Sultaniyya to Varamin: 288 km, Sultaniyya to Natanz: 435 km, Sultaniyya to Ushturjan: 505 km, Sultaniyya to Pir-i Bakran: 510 km, Sultaniyya to Yazd: 718 km. It is interesting to note that at the Ushturjan Friday mosque craftsmen who were involved into the first and the second decorative intervention on the Uljaytu mausoleum seem to have worked. If so, the Ushturjan Friday mosque must have been a more extensive project and a more prestigious commission which could attract these craftsmen.

not only a generator of new artistic knowledge and aesthetic output, but also as the generator of craftsmen's mobility. Similar should be considered for the projects of architectural revetments production which pre-date the Uljaytu mausoleum at Sultaniyya, such as the construction of the Ilkhanid summer palace at Takht-i Sulayman in 1270s, sponsored by Abaqa Khan, and construction of Ghazaniyya and Rashidiyya in Tabriz, by Ghazan Khan and Rashid al-Din. These monumental commissions perhaps impacted the transfer of knowledge within the territory of the Ilkhanid Empire and they could have partially determined craftsmen's mobility and transfers. But the described case of migration of craftsmen connected to the Uljaytu mausoleum is based on more solid evidence. The proposed routes of migration and destination of craftsmen connected to the Sultaniyya project therefore provide clear evidence indicating that rather than regional schools, craftsmen operated as independent workshops which were summoned for different types of commissions. Moreover, these workshops were, as shown, often mobile on a trans-regional level, rather than regionally. They impacted the spread and transfer of the arts of architectural revetments, which thus should not be attempted to be comprehended in a simplified manner according to regions, but rather, as each individual workshop with mobility itinerary determined by commissions of architectural revetment repertoires.

d.) The Evidence of Craftsmen's Signatures and the *Nisbas*

Fig. 73.

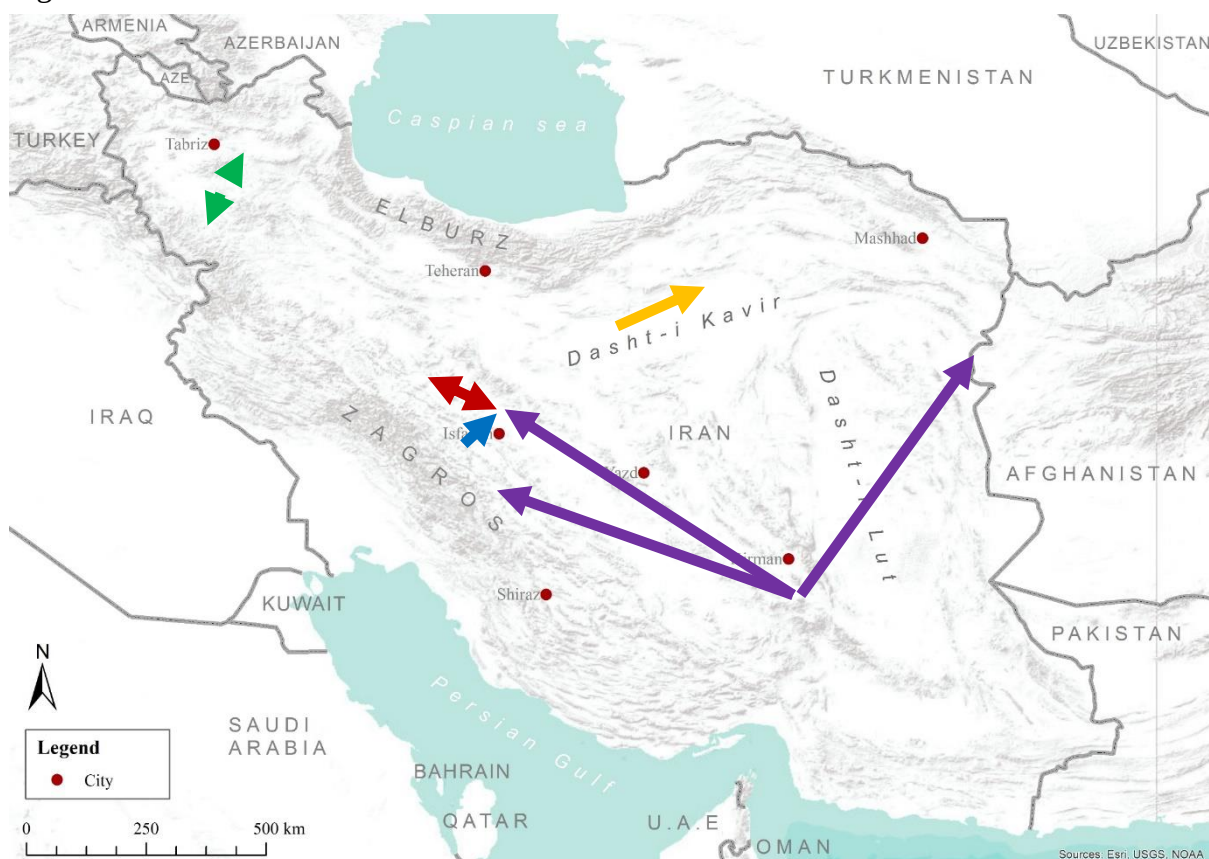


Figure 73: Supposed Ilkhanid stucco craftsmen's migrations as suggested by *nisbas* and repeating signatures.

The study of stucco signatures, their location, and their content shows that in some cases, stucco craftsmanship was a family enterprise. This was not a rule, and in many cases, it is evident that stucco revetments with related signatures were works of different masters who led separate

workshops. This research confirms that the signature's *nisba* is not always reliable evidence of the geographical provenance of an artist.⁸⁷¹ In some cases, artist's *nisbas* are linked to nearby settlements where they are found. Tabrizi artists, for example, signed the Marand (1330-1331; Cat. No. 22) and the Urumiya (presumably 1277; Cat. No. 23) Friday mosque mihrabs. Instead, these *nisbas* should be viewed as evidence of possible relationships between signatures and stuccoworks. This is illustrated in the case of Kirmani *nisbas* at Ushturjan, near Isfahan, Natanz, Turbat-i Jam and Sirjan. There are signatures in Natanz (Kucha-yi Mir mosque mihrab; Cat. No. 31),⁸⁷² Na'in (the Friday mosque minbar),⁸⁷³ Turbat-i Jam (Kirmani mosque stuccos and the external mihrab; Cat. No. 30)⁸⁷⁴ and Ushturjan (the Rabi'a Khatun Imamzada mihrab; Cat. No. 32),⁸⁷⁵ with *nisbas* of craftsmen from remote places, such as Kirman, which does not seem to have been a significant Ilkhanid stucco production centre, except for the Mir Zabir mausoleum near Sirjan (Cat. No. 33). Alternatively, it is possible that a lesser number of monuments in the Kirman region have been preserved. *Nisbas* should therefore be considered as partially reliable indicators of artisans' geographical origin. They must be considered together with stucco techniques and design as indicators of craftsmen's mobility and the mentioned question of the rate of monument preservation. Historic inscriptions nevertheless indicate that the Ilkhanid patrons often sponsored works in settlements connected to their *nisbas*, as at Ushturjan (1315-1316 refurbishment of the Friday mosque; Cat. No. 3), Natanz ('Abd al-Samad complex; phases: 1304, 1307-08; Cat. No. 12), Yazd (Rukniyya and Shamsiyya mausolea; Cat. No. 29) and Na'in (Baba 'Abdullah mosque; Cat. No. 9).

Taking the comparison of craftsmen's mobility routes based on their *nisbas* together with observations on the spread of stucco production technology and close studies of signatures, two different scenarios become apparent. The evidence of craftsmen's migration proposed here illustrates that the workshops should not be associated with regional schools, as proposed by Shani,⁸⁷⁶ but rather understood in terms of short and long-distance mobility.⁸⁷⁷

e.) Evidence of Stucco Craftsmen's Regional Mobility

Fig. 74.

The discussion of the monuments in the Catalogue of Monuments (appended to this work) proposes information concerning groups of monuments with stucco repertoires which were most likely works of the same stucco craftsmen's workshops. These hypotheses have been established based on detailed analyses of stucco craftsmen's signatures (which occasionally repeat, see above) and on research of stuccos: their artistic techniques, manner of joining different stucco panels into repertoires, remains of stucco polychromy (employed colouring principles) and their visual characteristics (inscription styles, vegetal and geometric ornamentation). It is accordingly possible to propose evidence for six geographical areas of migration of stucco craftsmen's workshops. Each case provides some information concerning the mobility of craftsmen's workshops, characteristics of their commissions and their final products. This allows the proposition of information on craftsmen's migration routes and the distance travelled, as estimated (as the crow flies) between monuments in different locations.

⁸⁷¹ See also O'Kane 1987: 39-40; Baer 1983: 301-302.

⁸⁷² *Work of Haydar al-Kirmani.*

⁸⁷³ *Work of ... Muhammad al-naqqash al-Kirmani.*

⁸⁷⁴ *Work of ... Kwaju ibn-i Zaki ibn-i Muhammad ibn-i Mas'ud al-Kirmani.*

⁸⁷⁵ *Work of Mas'ud al-Kirmani.*

⁸⁷⁶ Compare to Shani 1989, 67-74; Shani 1996, 85-118.

⁸⁷⁷ Grbanovic 2020, 612-613, 618.

The criterion to distinguish short and long distance mobility of craftsmen regards the distance they travelled. For short mobility, craftsmen travelled between up to four or five urban centres and up to some four hundred kilometres distance. For long-distance mobility, the craftsmen travelled longer distances between urban centres of different parts of Iran (Fig. 74).



Figure 74: Primary directions of long (blue) and short-distance (orange) mobility of Ilkhanid stucco craftsmen for imperial and minor commissions, based on evidence of stucco production technology, aesthetics and craftsmen's signatures.

Stucco Craftsmen Mobility in the Isfahan Region – Short and Long Distance Mobility

This research established that the following stucco repertoires of the Isfahan region were likely produced by the same stucco craftsmen workshop: the second decorative phase of the Farfan Friday mosque mihrab (early 14th century?; Cat. No. 5), the third decorative phase of stuccos at the Pir-i Bakran mausoleum (1312-13; Cat. No. 2), the rebuilding and redecoration of the Ushturjan Friday mosque (1315-16; Cat. No. 4) and the stuccos of the Haftshuya Friday mosque (early 14th century; Cat. No. 3). These stuccos share the selection of employed artistic techniques and stucco production technology. Moreover, they share design characteristics, elements of vegetal ornamentation, inscription styles and further visual features. The distance (as the crow flies) between these monuments (Farfan-Pir-i Bakran-Ushturjan-Haftshuya) amounts to some one hundred and ten kilometres. One of the repertoires, at Pir-i Bakran, is signed as *work of Muhammad Shah [al]-naqqash*, by possibly one of the stucco masters involved in production of these stuccos. These stucco repertoires have all been produced with locally available gypsum.⁸⁷⁸ Some of these programmes retain considerable amounts of

⁸⁷⁸ This research did not find any evidence of transport of gypsum over long distances. In fact, stucco repertoires are located in regions abundant with gypsum. In regions without gypsum, precedence is given to the other decorative media such as carved stone in southern Iran.

pigmentation traces and even gilding. Stucco craftsmen who produced these stuccos have therefore been operative on a regional level. They were joined by craftsmen who migrated long distance and who might have been involved in works at Sultaniyya (504 km from Ushturjan, as the crow flies) for its first and second decorative phases. But the Uljaytu mihrab was a separate stucco work. The origin of Haydar's workshop, responsible producing the Uljaytu mihrab, remains obscure, due to the lack of comparable stucco repertoires which are likely no longer extant. Judging from the visual characteristics of the mihrab, it seems plausible that its craftsmen were local stucco masters. It is also interesting to note that evidence of regionally mobile builders' groups has been documented in Isfahan region.⁸⁷⁹ The workshops which produced Ilkhanid architectural revetments on the monuments of the Isfahan region were therefore of partially local origin, which operated on a regional level, and partially migrants who might have arrived to the area from north-western Iran. Groups of builders seem to have operated within the given region.

Stucco Craftsmen Mobility at Abarquh, Yazd and Na'in

Documentation of monuments in the area stretching between Abarquh, Yazd and Na'in illustrates that this arid geographical unit retains a long-standing tradition of wall painting art.⁸⁸⁰ Research of the Ilkhanid and Muzaffarid monuments pinpointed the possible relations between their stucco repertoires and information concerning their craftsmen. The monumental carved stucco mihrab of the Abarquh Friday mosque (Cat. No. 10) is the work of the craftsmen's workshop which was likely in charge of the production of stuccos for the Sayyidun Gul-i Surkhi mausoleum in Abarquh (Cat. No. 11). This workshop received several commissions in Abarquh, but its origin remains unknown.⁸⁸¹ Research of the Hasan ibn-i Kay Khusraw mausoleum and the Sayyidun 'Ali al-Naqi mausoleum, illustrate the richness of the wall painting repertoires of these monuments, which are likely related to Ilkhanid wall paintings of the Yazd and Na'in area, for example, the Kamaliyya complex in Yazd (c. 1320; Cat. No. 29) and the remains of the wall painting repertoire at the Baba 'Abdullah complex at Na'in (Cat. No. 10). The discussion of the repertoires of Rukniyya (1325; Cat. No. 29) and Shamsiyya (1335 and later?; Cat. No. 29) demonstrates that the majority of craftsmen responsible for production of revetment repertoires of these two complexes, which comprised carved stucco, wall painting and applied moulded and stencilled stuccos, likely arrived to Yazd upon completion of the second decorative phase at Sultaniyya. Some of these monuments have been described as works of the *School of Yazd* by Blair and Kadoi, but in reality, these revetments were spread out across a more extensive geographical unit.⁸⁸² These craftsmen therefore migrated long-distance. Upon arrival they seem to have established themselves in the

⁸⁷⁹ The shared characteristics of monumental *iwan* structures of the Pir-i Bakran mausoleum and the Garladan *iwan*, 21 km to the north as the crow flies (the Shaking minarets; a funerary *iwan* once located within a cemetery), indicate that these two structures were most likely constructed by the same group of builders. Another such example has been discussed in detail by Wilber and it concerns the similarity in construction technology and architectural form of the three Ilkhanid mosques to the east of Isfahan: the Friday mosques of Dashti, Kaj and Iziran.

⁸⁸⁰ Some of the best examples are the wall painting repertoires at the Sar-i Kucha mosque in Muhammadiya near Na'in (11th century?), the wall paintings at the Davazda Imam mausoleum in Yazd (which might have been redecorated in the Ilkhanid period) and presumably Ilkhanid wall painting repertoire at the Farasha Qadamqah (dated c. 1300).

⁸⁸¹ The characteristics of the stuccos it produced are close to the stuccos of the Isfahan region, which might point towards mobility of craftsmen between these two areas and consequent exchange of ideas and production technology.

⁸⁸² Blair 1986a; Kadoi 2005.

Muzaffarid capital and operated regionally. Research of the revetments in carved stucco (the group of cenotaphs) and wall painting medium in the mausoleum of the Baba ‘Abdullah complex in Na’in did not yield enough evidence concerning the origin of craftsmen responsible for production of these revetments.

Stucco Craftsmen’s Mobility in the Northern part of Central Iran

Research of monuments with stucco repertoires located in the geographical area between Isfahan and Qum pinpointed decorative programmes which were works of two distinct craftsmen’s workshops. The first group of monuments comprises stuccos at the shrine of the ‘Abd al-Samad complex in Natanz (stuccos are dated 1307-08; Cat. No. 12), the stucco mihrab of the Baba Afzal complex near Maraq (early 14th century; Cat. No. 14) and the stucco mihrab of the Imamzada Yahya and Fazl in Mahallat-i Bala (1335-36; Cat. No. 13). The stuccos at Natanz and Mahallat-i Bala are both dated and signed by the same stucco master. The mihrab at Maraq can be associated with these two stucco repertoires due to their matching inscription styles, manner of its production and use of similar artistic techniques for the making of the three repertoires. The craftsmen’s workshop in question therefore appears to have been regionally mobile to a distance of some one hundred and fifty kilometres (as the crow flies), but the actual distance which the craftsmen had to travel via the roads was considerably longer.⁸⁸³

The second group of stucco repertoires comprises three stucco mihrabs in the Kashan Friday mosque’s north-western hypostyle hall (now badly damaged), the ‘Ali mosque in Nushabad and the Miyandih mosque in Qamsar. These three monuments are located at a total of forty kilometres distance (as the crow flies). The difference in dimensions between the three mihrabs is at first sight striking, but it has to be understood as informative of the characteristics of stucco revetments commissions. The three mihrabs are difficult to date exactly, based on their visual characteristics; until further archaeometric data is available, both Seljuq and Ilkhanid dates remain plausible.⁸⁸⁴ The gathered evidence confirming the argument that the three mihrabs are works of the same workshops is however considerable. This is informative of practices of stucco workshops. It indicates that the same workshops oversaw the production of stuccos of more modest and more monumental projects, which depended on the status of the patron and the endowment available to produce the repertoire.

Examination of architectural structures of the investigated monuments in the given geographical area illustrates that it is difficult to establish how the builders’ groups operated in

⁸⁸³ These three repertoires are characterized by a distinct type of double incision outline for their cursive inscriptions in *Naskh* and *Thuluth* styles. The stuccos were produced with a relatively limited selection of stucco artistic techniques, which comprised carving of several consecutively applied layers of fine stucco material, heavy perforation of stucco relief surface and in the case of Maraq and Mahallat-i Bala, specific designs of inscription compositions in Square Kufic. They also share elements of vegetal ornamentation in forms of floral scrolls and palmette designs. Observations of the locations of the three stucco repertoires provide evidence indicating that the craftsmen’s workshop had to be summoned for every commission, rather than being randomly itinerant in search of commissions. This is perhaps best illustrated by the mihrab at Maraq, which is located off the main communication routes. It is clear that the workshop had to be called to the settlement to perform the production of stuccos.

⁸⁸⁴ According to Amir Hossein Karimy, the Nushabad mihrab was produced with Ilkhanid stucco production technology. Personal communication to the author. Moreover, the Kashan mihrab covers an earlier wall painting medium mihrab, which likely dates to the Seljuq period. This increases the possibility of the Kashan mihrab to date to the periods later than Seljuq. The mihrabs at Qamsar and Nushabad are both located in residential, secondary, mosques of settlements, which might have been built due to the settlement growth and need for new infrastructure, which could have occurred in the context of the population boom during the Ilkhanid Golden period.

this area. Blair suggests that there exists evidence of architectural element construction knowledge (such as the building of cross vaults) being transferred by the means of builders, to the area of Natanz from north-western Iranian territory.⁸⁸⁵ This may be interpreted as evidence of builders' migration from north-western to central Iran, in Ilkhanid period.

Stucco Craftsmen Mobility within the Region of Qum – the Qum School?

Research of Ilkhanid monuments in the area of the holy city of Qum (Cat. No. 15) pinpointed around a dozen monuments with stuccos. Most of these monuments are funerary structures which retain the function of mausolea or *imamzadas*. Earlier research of architectural structures of these monuments by Wilber enabled for their distinction into three typological groups according to their architectural structure.⁸⁸⁶ Comparison of these monuments and their stuccos reveals that these funerary structures were likely built and decorated by a restricted number of builders and stucco craftsmen's workshops which operated in the area of Qum from the late thirteenth century onward (the Imamzada Shah Ja'far is one of the earliest monuments in the region with historic inscriptions on its revetments dated 1268-69). Differently to other regions, construction of related types of monuments and production of stucco revetments in Qum continued far beyond the Late Ilkhanid period into the time of the Safi dynasty's rule, with monuments dated as late as 1447 (e. g. the Imamzada Zayd), which closely mimic stuccos of the Ilkhanid period in terms of employed artistic techniques, visual elements and aesthetics.

Extant monuments indicate that the area of Qum witnessed a building boom of funerary structures for around one and a half century. The fact that the architectural structures of these monuments often repeat, at a rate not detected in other regions of the Ilkhanid Empire, indicates that these funerary structures were built by a limited number of builders' groups. Interiors of these monuments were frequently revetted in carved stucco medium and in some cases with lustre tiles. A close examination of these stucco programmes leads to the conclusion that the stucco repertoires are also related to each other. One of the best examples is provided by the three mausolea at the Bagh-i Sabz.

The research of the Bagh-i Sabz monuments (the 'Ali ibn-i Abi al-Ma'ali ibn-i 'Ali Safi mausoleum) provides significant evidence concerning personages involved in construction and decoration of the mausolea at Qum. The two signatures of the master stucco craftsman in charge of production of the stuccos (*Work of 'Ali ibn-i Muhammad ibn-i Abi Shujj'a al-banna'*) and the architect of the monument (*This building is work of Hasan ibn-i 'Ali ... Abi al-banna'...*) provide primary evidence indicating that medium and monumental dimension mausolea were designed by architects and that their stuccos were produced by separate stucco craftsmen's workshops. The repetition of the architect's signature on another monument in the proximities of Qum (the Khadija Khatun mausoleum in Khalijistan)⁸⁸⁷ reflects works of the architect within this restricted geographical unit. Monuments of similar forms are rarely found in the other regions of the Ilkhanid Empire, indicating that the builders of the Qum mausolea restricted their

⁸⁸⁵ Blair 1986a, 31-34.

⁸⁸⁶ Type One: octagonal structure with a polyhedral dome with octagonal form in the interior and a hemispherical interior dome. Type Two: octagonal exterior structure with a sixteen-sided drum and a sixteen-sided tent dome; the interior of the structure is also octagonal, sixteen-sided transitional zone and a hemispherical interior dome. Type Three: octagonal exterior structure, with a sixteen-sided drum, with a sixteen-sided tent dome. The interior is octagonal with an inscription frieze running along the upper portions of supporting walls and a decorated hemispherical dome. See Wilber 1955, 113-116.

⁸⁸⁷ Tabataba'i 1976, Vol. 2, 202-206; Hillenbrand 2014, 82; endnote no. 49. See also Cat. No. 18.

building activities to the area of Qum.⁸⁸⁸ Qum was a centre for Shi‘ite pilgrimage and the central shrine complex of Fatima Mas‘uma⁸⁸⁹ impacted the increased demand for burial and funerary structures to be built in its proximities and in the surroundings of the holy city. Nevertheless, funerary structures with their stuccos were a phenomenon tied to the sacred city of Qum, and in stark contrast to architecture of the other important pilgrimage centre, the city of Mashhad. At Mashhad, the Ilkhanid urban context of the city functioned in a different manner. There, the commissions of the Ilkhanid period focused on the shrine complex, rather than individual funerary monuments as in Qum.

Characteristics of Qum stuccos are in stark contrast to stuccos found in the Isfahan area, which are characterized by deep and protruding reliefs, stucco undercut, applied protruding elements and a wider repertoire of vegetal elements and inscription styles. Stuccos of Qum are also different from the stuccos in the northern part of central Iran, stretching between Natanz, Kashan and Mahallat-i Bala. Stuccos at Qum were produced in a manner specific to the area and determined by stucco craftsmen who operated in the given geographical unit. The small number of stucco workshops operated independently, but in a more restricted geographical area. The system of transmission of stucco knowledge and the system of construction and decoration of monuments in Qum is similar to other regions. While it would be possible to suggest that these stuccos are works of a regional school, from the point of view of their characteristics, the system of their production does not meet the criteria for them to be considered so. The situation in Qum would therefore be more appropriately labelled as a case of a local tradition and not as works of a regional school.

Stucco Craftsmen Mobility in North-eastern Iran

Research of Ilkhanid monuments located in north-eastern Iran discerned two different groups of monuments with stuccos which were produced by two distinct workshops. But some monuments and their stuccos were difficult to associate with any other monuments, due to their unique and considerably distinct technological and visual characteristics. The first group of monuments is located in the area between Simnan, Damghan and Bistam. These monuments were works of the Damghani stucco craftsmen’s workshop, which consisted of the master stucco workmen from one family (father and two sons). The following monuments with stuccos also retain signatures of these master stucco craftsmen: the no longer extant mosque structure next to the Pir-i Alamdar tower in Damghan, the Kashana tower and the Bistam Friday mosque (Cat. No. 18) and the Bayazid Bistami complex in Bistam (Cat. No. 19). Detailed research of stucco repertoires also led to the stuccos of the Jawin Friday mosque (Cat. No. 20) and those of the Hasan al-Kharaqani complex near Bistam (Cat. No. 21) to be associated with works of the Damghani family. These repertoires are not signed, but they were produced with the same artistic techniques and they feature closely related ornamental elements and compositions, to the works of the Damghani family. It is plausible that these two repertoires could be works of some craftsmen associated with the Damghani family stucco workshop. The total distance between the mentioned monuments amounts to some two hundred and forty kilometres (as the crow flies).⁸⁹⁰

⁸⁸⁸ It seems likely that the builders operated in this restricted region due to the constant demand for the specific types of funerary structures and they thus did not need to accept commissions within a larger geographical scale.

⁸⁸⁹ Qasimi 2010, Vol. 12, 154-179; <https://archnet.org/sites/1653> (Last Accessed: June 7, 2021).

⁸⁹⁰ The distance which the craftsmen had to travel is comparable to those estimated for the two workshops operating in the northern part of central Iran.

The described visual characteristics of stuccos are related to stuccos of the second group comprising the last decorative stage of the Farumad Friday mosque (Cat. No. 16) and the stuccos of the Khusraw Shir Friday mosque (Cat. No. 17). A closer look at these two repertoires reveals that they share numerous characteristics with the stuccos of the Damghani family. The stuccos of Khusraw Shir resemble those of Farumad so closely that they are most likely works of the same stucco craftsmen's workshop which signed the Farumad repertoire in four different spots. The described case thus provides evidence of stucco craftsmen's mobility at a distance of some fifty kilometres in a north-east direction (as the crow flies).

Discussion of the repertoires produced by two workshops of craftsmen therefore provides evidence of workshops operating regionally. Stuccos produced by these workshops were considerably different, compared to those of the Isfahan area of north-western Iran. Lack of the presence of any technological innovations in these stuccos, and their considerably more archaic appearance might indicate that these workshops operated in relative isolation from the other regions of the Ilkhanid Empire. Nevertheless, cases of stucco repertoires which cannot be associated with any of the two workshops, on monuments located close to the areas where the two workshops operated, might point towards the arrival and long-distance mobility of other stucco workshops. This seems to be the case for the monumental stucco repertoire of the Varamin Friday mosque (Cat. No. 28), which is located in the area between Qum and Simnan; a wide selection of stucco artistic techniques, specific elements of vegetal decoration such as lotus-like composed panels, relative depth of protruding stucco reliefs and attention to minute details of stucco reliefs of the Varamin repertoire indicate that its craftsmen likely arrived from Sultaniyya.⁸⁹¹

Moreover, two isolated cases of Late or post-Ilkhanid stuccos at Tus (the Haruniyya mausoleum)⁸⁹² and Sarakhs (the Mausoleum of Baba Luqman; stuccos dated 1335)⁸⁹³ display entirely different aesthetics of stucco revetments, which cannot be associated with those of the Ilkhanid Empire's territory. The still extant stuccos at Tus are found in muqarnas of the mausoleum's interior and exterior. The muqarnas cells display a specific type of shallow and bevelled relief of vegetal compositions, which might indicate that these stuccos were in fact produced by moulding rather than stucco carving. No parallel for these stuccos has been found, which might indicate migration of their craftsmen from the area to the north-east or east of the Ilkhanid Empire's borders. Stuccos at Sarakhs are preserved only in parts, around the interior of the mausoleum's monumental entrance *iwan*. Originally there existed other, more extensive parts of the repertoire in the mausoleum's interior, as indicated by fragments of a monumental inscription band and some panels of perforated stucco. These stuccos were carved out of one layer of stucco, at an almost ninety degree angle which determined the contrasting appearance of their relief. The vegetal scrolls in the background of the inscription bands are repetitive to the point that it seems that they could have been incised with the use of stencils. A second layer of stucco might have been planned to be applied and carved, but this appears not to have been performed. Stuccos of Sarakhs also display a different production technology and visual appearance, which is difficult to associate with other Ilkhanid stuccos of this region, and which might indicate that the craftsmen who produced this repertoire arrived from areas to the north-east of the Empire's borders. These stucco repertoires indicate that possibly, some of the stuccos

⁸⁹¹ This is plausible, given that it has been shown that the artisans responsible for the production of glazed revetments of the mosque most likely arrived at Varamin upon the completion of works at Sultaniyya.

⁸⁹² Wilber 1955, 145-146; <https://archnet.org/sites/3885> (Last Accessed: June 7, 2021).

⁸⁹³ Wilber 1955, 184; <https://archnet.org/sites/3893> (Last Accessed: June 7, 2021).

in north-eastern Iranian territory might have been produced by workshops which arrived in the area from beyond the boundaries of the Ilkhanid Empire.⁸⁹⁴ In doing so, they brought new technology of stucco production to Iran and impacted the visual appearance of stuccos.

One more stucco repertoire stands out in the context of Ilkhanid stucco repertoires, located in north-eastern Iran: the two carved stucco repertoires at the Old and the Kirmani mosques of the Turbat-i Jam complex (Cat. No. 30). These two monumental stucco repertoires were produced by master stucco craftsmen, but their production technology and visual appearance have little to do with the nearest repertoires at Tus and Sarakhs. The nearest comparable stucco repertoire, which was signed in a similar manner to the two mihrabs at the Kirmani mosque, is located at the Mir Zabir mausoleum in Sirjan (Cat. No. 33) although the design, inscriptions and ornamental compositions of the mihrab, is considerably different to the stuccos at Turbat-i Jam. Stuccos of Turbat-i Jam, similar to the monumental wall painting repertoire in the Gunbad structure of the complex, seem to have been produced by craftsmen who had to be summoned to the complex for the commission, perhaps from a great distance.

Evidence of regional and long-distance mobility of stucco craftsmen in the area of the north-eastern Iranian territory indicates that during the Ilkhanid period, there was no unified system or a network of stucco revetment production. Rather, in some cases, workshops operated regionally, and in the other cases craftsmen seem to have been mobile over long distances to produce stucco repertoires. This contrasts the situation in pre-Ilkhanid periods, especially in the period between the eleventh and twelfth centuries, when a considerably higher number of monuments was built in north-eastern Iran. These monuments display a more unified approach to production of their revetments in carved stucco, glazed elements and terracotta media. This indicates that between the Seljuq and the Ilkhanid period, patterns of patronage and socio-political situation in this part of the Iranian territory probably changed considerably. It is also possible that the area was saturated with monuments and infrastructure by the time of the beginning of the Ilkhanid reign and that there was no especial need to construct new monuments.⁸⁹⁵

Stucco Craftsmen Mobility in North-western Iran

Research of monuments in north-western Iran and the territory of modern Azerbaijan and the Nakhchivan enclave provides information on patterns of production of stuccos in the north-western part of the Ilkhanid Empire. It has been possible to discern two groups of monuments with stuccos. The first group comprises three congregational mosques at Urumiya, Tabriz and Marand (Cat. Nos. 23, 24, 22), which present stuccos produced in similar traditions, but as works of different workshops, one of which seems to have been of regional origin. The second group consists of the *Khanqah* complexes of Alinja and Pir Husayn (Cat. Nos. 26, 25) in the Caucasus, each of which presents different stuccos, which seem to be works of craftsmen who migrated long distances from north-western Iran, for the purpose of producing these repertoires.

The two mihrabs at the Urumiya and Marand Friday mosques were both installed into earlier monumental domed prayer halls which date to the Seljuq period. These two mihrabs seem to have been produced some six decades apart if the dating of the Urumiya mihrab (1277-78) is to

⁸⁹⁴ Further evidence would be necessary to confirm this hypothesis. Earlier stucco repertoires in the territory of modern Turkmenistan at Dandanqan and Dihistan indicate the existence of a stucco art tradition in this territory.

⁸⁹⁵ Moreover, the described lesser amount of building and decorative undertakings in the area of north-eastern Iran in the Ilkhanid period likely reflects the lesser significance of this region, compared to the central and north-western Iranian territory, which presented the core of the Ilkhanid Empire.

be considered correct and not the work of later repairs. But the Marand mihrab dating seems to be reliable (1330-31). Yet the two mihrabs feature some closely related characteristics, such as the form of the internal niche arches and placement of signatures of craftsmen (both with the *nisba* Tabrizi).⁸⁹⁶ It is thus possible to conclude that the two workshops of master craftsmen with the *nisba* Tabrizi, who signed these mihrabs, could have either collaborated or trained together, but they worked as separate workshops, apparently, at a regional level. The mihrab of the Tabriz Friday mosque is preserved in fragments and its date is uncertain. Its monumental lunette displays stucco which has been undercut and also a complex composition produced by application of large protruding hollow elements.⁸⁹⁷ These three mihrabs are therefore works of three distinct workshops, which are likely to have operated at regional and trans-regional level. This might reflect the fact that Tabriz was an Ilkhanid capital.⁸⁹⁸ They are also not excessively distant from each other (Marand – Tabriz – Urumiya, distance amounts to some one hundred and eighty kilometres as the crow flies). The second group of monuments is presented by the three stucco mihrabs of the two *khanqahs* which are located in Azerbaijan (the Pir Husayn Khanqah, Cat. No. 25) and in Nakhchivan (the Alinja Khanqah, Cat. No. 26). Their research indicates that these three mihrabs have little in common with mihrabs of the north-western Iranian territory, but that based on their production technology and visual characteristics, the mihrabs were likely produced by craftsmen who migrated long-distance from the Iranian territory in order to perform these two separate commissions.

Discussion of the two groups of related stucco repertoires indicates that, in the Ilkhanid period, in north-western Iran, stucco workshops operated regionally, and in other cases craftsmen were mobilized long-distance, beyond the current borders of Iran to produce stuccos in the Caucasus. It is likely that there were more monuments, but that only two survived to the present times. While it is possible to propose some common characteristics of stuccos in north-western Iran, there is no evidence of a regional school, which would have been centrally coordinated. The described situation is considerably different, to pre-Ilkhanid times. It seems that during the Seljuq period, there were more commissions of stuccos in north-western Iranian territory. Moreover, these Seljuq stuccos, such as those at Takistan, Qurva and Sujas were produced by regionally mobile workshops. A greater number of regionally mobile workshops and a lesser amount of extraordinary long-distance commissions in the Seljuq period ensured for a greater uniformity between stuccos of north-western and northern parts of central Iran. But the mechanisms behind their production were similar to the Ilkhanid period, in which each workshop operated independently, rather than them being coordinated centrally.

Stuccoworks Signed with the Nisba Kirmani – Evidence of Knowledge Transfer?

Research of monuments also focused on the case of four stucco repertoires, which are signed in a similar manner, in three out of the four cases by different craftsmen with the related *nisba* Kirmani. These four repertoires comprise the stuccos of the Kirmani mosque at the Turbat-i Jam complex (Cat. No. 30), the Mir Zabir mausoleum at Sirjan (Cat. No. 33), the mihrab of the Imamzada Rabi'a Khatun in Ushturjan (Cat. No. 32) and the mihrab of the Kucha-yi Mir mosque at Natanz (Cat. No. 31). Salihi, Rashidniya and Taghavinejad have proposed that these stuccos are works of a Kirmani stucco school and that the same workshop was responsible for

⁸⁹⁶ But the minute details of their inscription bands and stucco vegetal compositions are considerably different.

⁸⁹⁷ The described technique has not been spotted on pre-Ilkhanid stuccos and might derive from or be related to the stuccos of the Ilkhanid period in Central Iran.

⁸⁹⁸ Lorenz Korn, personal communication to the author.

their production.⁸⁹⁹ A close examination of these stuccos and their signatures contradicts this hypothesis. Rather than being works of the same workshop or a school, these stuccoworks present a case which is more similar to the mihrabs of the Urumiya and Marand Friday mosques in north-western Iran. Similarly the Kirmani *nisba* stuccos should be understood as works of craftsmen who might be related or who trained together, but they were heads of different workshops, which operated independently from each other.

Locations of the monuments where these stuccos are found are distant and amount to the total of 1440 kilometres as the crow flies (Natanz-UShturjan-Sirjan-Turbat-i Jam). Compared to the other cases of craftsmen workshop' mobility discussed in this research, the distance between the Kirmani stuccoworks would be considerably longer and unprecedented for the Ilkhanid period. But the case of the signature of the head of the carpentry workshop on the wooden minbar of the Na'in Friday mosque, which also retains a *nisba* Kirmani (combined with a *nisba* of a craftsman of the lower rank recruited locally, from Muhammadiya) indicates that Kirman might have been an important centre of origin for woodworking craftsmen during the Ilkhanid period.⁹⁰⁰ This presents additional evidence against the hypothesis that these stuccos could be works of one workshop. The examined stucco repertoires therefore do not present any evidence of a stucco school.

f.) Regional Stucco Craftsmen Mobility – Distances and Mobility Routes

Discussion of stucco craftsmen's workshops, related stucco repertoires and signatures of heads of workshops enables some data to be proposed concerning stucco craftsmen organization, workshops' mobility and patterns of stucco production knowledge transfer. This examination established six geographical areas of stucco mobility (Isfahan region, Abarquh-Yazd-Na'in, northern part of central Iran, Qum area, north-eastern Iran, north-western Iran). These areas of stucco craftsmen mobility were partially shaped by the availability of the material (gypsum) and the demand for stuccos (rate of commissions in settlements, e. g. Qum). At the present state of research, it remains unclear whether networks of patronage of the Ilkhanid state organization played a role in forming these regions. It has been shown that in these regions stucco craftsmen operated based on regional mobility and long-distance mobility. Information concerning regional mobility of some eight workshops, which produced more than one stucco repertoire has been pinpointed. These workshops produced stuccoworks of dimensions and extent depending on commission, which could be of lesser or greater prestige. The workshops were not itinerant per se, rather, they were summoned for commissions of stucco revetment production.⁹⁰¹ The discerned distance of mobility which could be supported by considerable evidence allows the estimate of these workshops being mobile at a distance of up to around two hundred and forty kilometres as the crow flies. The evidence indicates that craftsmen's workshop mobility was not confined to natural boundaries forming distinct geographical areas. Workshops operated as limited by the mentioned distances, which could have been impacted by the regional demand for stucco production and patterns of patronage tied to the local authorities of the Empire. It also seems that workshops moved long-distance only when they

⁸⁹⁹ Salihi, Rashidniya and Taghavinejad 2018.

⁹⁰⁰ This minbar dated 1311-12 is signed: *work of the Master, Pride of Crafts, Mahmud al-Naqqash Kirmani, written by al-'Abd al-Hakim al-Muhammadi*.

⁹⁰¹ The workshops would travel longer distances in search of work if they were itinerant per se. The six regions are limited in dimensions, due to the demand and summoning of regionally available craftsmen's stucco workshops.

were summoned for specific projects. Such mobility occasionally, resulted in a re-settlement of craftsmen who transformed into regionally-operating groups, such as the case of Yazd.

In sum, mobility of stucco craftsmen determined the spread and transfer of stucco production technology and approaches across separate geographical areas. Although there existed no centralized system of stucco workshops, the transfer of knowledge of stucco production and design occurred through craftsmen's mobility and especially apprenticeship. The cases of the Urumiya and Marand Friday mosque mihrabs and the case of the four Kirmani *nisba*-signed mihrabs indicate that upon the completion of an apprenticeship in a workshop, craftsmen could have formed their own workshops and worked independently. It was this mechanism, together with material characteristics of stucco, that determined the generally uniform appearance of stuccos within a specific geographical unit. But this was not the norm, as cases of long-distance mobility of craftsmen were documented for almost every geographical unit in question. Regional styles were therefore determined by craftsmen's workshops which operated in these geographical units, rather than by a centralized system such as *stucco schools*. The system of apprenticeship and described transfer of knowledge from workshop to workshop should rather be described as a stucco tradition, and accordingly a group of local traditions, instead of schools.

Conclusion

Information gathered in this research, which concerns the identity and mobility of craftsmen, and artistic procedures behind production of carved stuccos, illustrates numerous subtle differences between revetments in stucco and other decorative media. Differences in rendering signatures, their placement and visual forms, are workshops' markers. Each of these workshops possessed specific stucco production approach(es). The bulk of these features of stuccowork can trace works of distinct workshops and their mobility across the Ilkhanid Empire. It thus becomes evident that stucco programmes should not be understood in terms of regional schools, but as products of itinerant craftsmen's workshops who passed their knowledge from generation to generation by the means of apprenticeship in workshops. The carved stucco craftsmanship' practice and this specific artistic technique reflect themselves in the final products and in forms and content of craftsmen's signatures. Further evidence against the understanding of stuccos as works of regional schools is provided by the discussion indicating that the stucco workshops mainly worked in isolation and that their exchange of knowledge with other craftsmen above all occurred with sectors of building, stone carving and terracotta production. This work in isolation resulted in differences of stucco revetment designs, signature placing, stucco production technology and aesthetic appearance of stuccos, compared to revetments in other media. Stucco workshops were not regionally confined and they frequently travelled longer distances for commissions, which went beyond regional borders. This evidence of long- and short-distance stucco workshop mobility challenges the common understanding of regionally confined stucco schools.

Every stucco workshop retained its own repository of stucco production techniques, modalities of approaches to carving, design principles, epigraphic styles, and geometric and vegetal ornamentation vocabulary, all of which determined the final aesthetics of its stuccoworks. Mobility of craftsmen can therefore be determined on the basis of minute observations of these features which make it possible to attribute them to distinct workshops. Accordingly, no regional schools of stucco production existed, but individual stucco craftsmen's workshops travelled for the purpose of undertaking commissions in larger or smaller and more remote settlements. When necessary, as was the case for the Uljaytu mausoleum at Sultaniyya (phase

one: from 1305-06 to 1310; phase two: from 1313-14 to 1316/20; Cat. No. 27) and other no longer extant structures of such dimensions, craftsmen were mobilised from afar to undertake monumental commissions. Their participation in such projects was an experience which transformed their knowledge and skills and thus impacted their works upon the completion of projects. Such monumental undertakings therefore functioned as generators of knowledge exchange and innovations, of mobilization of large numbers of craftsmen and as epicentres from which the newly generated knowledge and know-how transferred and dispersed into other areas of the Empire, once the projects were completed.

The only exception, for the stuccos of Ilkhanid period, is presented by the case of the Qum mausolea. These mausolea are located in a restricted geographical unit and they share characteristics of their technology of production, decorative principles and aesthetics. They were produced by a restricted number of stucco workshops, which operated in the area of Qum. This is perhaps the only example of a small regional school of stuccos in the given chronological frame, although at Qum too, the workshops operated independently, rather than in a centralized manner, which would be necessary to name them as a school organization. This phenomenon has not been observed in the other regions, where craftsmen were mobile over longer distances and workshops operated in greater isolation and with increased individuality. It is likely that these workshops did not travel elsewhere, because there was no need for them to undertake commissions outside of Qum, due to the building boom, which occurred in the city during the Ilkhanid period and thus determined the constant demand for new stucco repertoires. Formation of the regional phenomenon of stuccos at Qum was therefore pre-conditioned by the socio-economic situation in the settlement with a specific pilgrimage function of its central shrine complex, rather than through craftsmen's choice or decision.

These findings concerning the question of stucco schools and craftsmen's workshop mobility during the Ilkhanid period should not be understood as exemplary for the carved stucco medium across a greater chronological and geographical span. Rather, they seem to be phenomenon tied to the geographical features and public infrastructure of the Ilkhanid Empire, reforms of the construction sector by Gazan Khan, patterns of patronage characteristic of the Ilkhanid era and stucco production technology. The discerned mobility of Ilkhanid stucco craftsmen on short and long distances and beyond the region, but nevertheless limited to a certain extent, can be viewed as determined by the society for which stuccos were produced.

Compared to earlier periods, the mobility of Ilkhanid stucco craftsmen was more fragmented and more individual, and stucco production was more specialized between workshops. A greater uniformity of carved stuccos, and their distribution across a more extensive geographical area has been demonstrated to have existed in 'Abbasid period, when production technology of stuccos was less complex.⁹⁰² The described difference is likely reflected in the size of the governing Empire, communication networks and the socio-political context of the patronage system. In the 'Abbasid period, commissions of stucco were likely organized in a more centralized manner, because they show uniformity in the geographical area stretching from Mesopotamia to Central Asia. This system fragmented through the passing of time and by the means of specialization of the stucco craftsmen's sector and advancing of stucco production technology. For the Seljuq stuccos in the Iranian territory, regional differences are better visible

⁹⁰² Andrea Corsi, personal communication to the author. Corsi, Andrea 2021, *Early Abbasid stucco decoration in Iraq and Iran (750-850): origin, spread and development. The unpublished corpus of Early Abbasid stucco from the excavations in the Friday mosque of Isfahan*, PhD Thesis, University La Sapienza, Rome. (In Italian)

and might indicate that the craftsmen operated on a more regional level, rather than trans-regional, but the specializations of different workshops were already discernible. This developed further in Ilkhanid period, when stucco craftsmen's workshops functioned as entirely individual units, which operated based on commissions and summoning and which retained their own approaches and technology of stucco production.

Appendix. No. 3: Information concerning patronage of Ilkhanid monuments with carved stucco repertoires.

Monument	Location	Cat. No.	Date	Period	Function	Type of Intervention	Intervention dimensions	Ilkhanid Patron	Patron's status	Other persons
Isfahan Friday mosque; Uljaytu mihrab	Isfahan	1	1310	Golden	Congregational mosque	Mihrab installation	monumental	Muhammad al-Sawi	minister	'Ali 'Adud al-Mastari (overseer)
Pir-i Bakran mausoleum	Pir-i Bakran	2	1298-1313	Golden	Pilgrimage complex	Rebuilding and redecoration	medium	unknown	Ilkhanid official of middle rank	
Haftshuya Friday mosque	Haftshuya	3	c. 1320	Golden	Congregational mosque	Rebuilding and redecoration	medium	unknown	Ilkhanid official of low or middle rank	Seljuq foundation
Ushturjan Friday mosque	Ushturjan	4	Seljuq; 1315-16	Golden	Congregational mosque	Rebuilding and redecoration	medium	Muhammad ibn Mahmud ibn 'Ali al-Ushturjani	Ilkhanid official	Seljuq foundation?
Farfan Friday mosque	Farfan	5	Seljuq-Ilkhani d?	Golden	Congregational mosque	Redecoration ?	small	unknown	Local notable or Ilkhanid official	Seljuq foundation?
Pa Minar mosque	Zavara	6	Seljuq-Ilkhani d	Early	Residential mosque	Redecoration	medium	unknown	Ilkhanid official of lower or medium rank	Seljuq patron Abu Abdullah Muhammad Ibrahim
Gar Friday mosque	Gar	7	1260	Early	Congregational mosque	Rebuilding and redecoration	medium	Rashid al-Din Muhammad Kamil Ahmad ibn Ismail	Perhaps an Ilkhanid official	Ibn Abi al-Qasim
Kuhpaya Friday mosque	Kuhpaya	8	Ilkhani d mihrab ?	Golden ?	Congregational mosque	Rebuilding and redecoration	medium	unknown	Local notable or an Ilkhanid official?	Safavid patrons
Baba 'Abdullah complex	Na'in	9	1300; 1335-36 (wall painting)	Early; Late	Mosque and mausoleum	Foundation	medium	1300: Muhammad ibn Shams al-Din ibn Abi 'Abdullah	Ilkhanid official?	
Abarquh Friday mosque mihrab	Abarquh	10	Ilkhani d; 1337-38	Late	Congregational mosque	Mihrab installation	medium	unknown	Local notable or an Ilkhanid official?	Pre-1337-38 foundation
Mausoleum of Hasan ibn Kay Khusraw	Abarquh	11	1307-1318-19	Late	Mausoleum	Foundation	medium	Hasan ibn Kay Khusraw	Ilkhanid official?	
Mausoleum Sayyidun Ali al-Naqi	Abarquh	11	c. 1320	Late	Mausoleum	Foundation	medium	unknown	Local notable or an Ilkhanid official?	
Mausoleum Sayyidun Gul-i Surkhi	Abarquh	11	c. 1320	Late	mausoleum	Foundation	medium	unknown	Local notable or an Ilkhanid official?	
'Abd al-Samad complex	Natanz	12	Buyid-Seljuq-Ilkhani d (1307-1320)	Golden ; Late (minaret)	Pilgrimage complex	Rebuilding and redecorations	monumental	Zayn al-Din 'Ali al-Mastari al-Natanzi; Shams al-Dawla wa al-Din Muhammad	Ilkhanid officials	Shams al-Din Muhammad ibn 'Ali al-Natanzi (overseer); Taj al-Din 'Ali ibn Ibrahim al-Natanzi

								ad ibn Abi 'Ali		(overseer); Kamal al-Din Muhammad (overseer)
Imamzada Yahya wa Fazl	Mahallat-i Bala	13	1335-36	Late	<i>Imamzada</i>	Foundation	small	unknown	Local notable or an Ilkhanid official?	
Baba Afzal mausoleum	Maraq	14	Early 14 th century	Golden	Pilgrimage complex	Foundation	small	unknown (a Zangid ruler?)	Local notable?	
Kashan Friday mosque carved stucco mihrab	Kashan	N.A.	First decades of 14 th century	Golden	Congregational mosque	Redecoration of a mihrab	monumental	unknown	Ilkhanid official of medium or higher rank?	Earlier patrons
Qamsar Miyandih mosque	Qamsar	N.A.	First decades of 14 th century	Golden	Residential mosque	Foundation	small	unknown	Local notable or low rank Ilkhanid official?	
'Ali mosque Nushabad	Nushabad	N.A.	First decades of 14 th century	Golden	Residential mosque	Foundation	small	unknown	Local notable or low rank Ilkhanid official?	
Gunbad-i Sabz mausoleum	Qum	15	c. 1330	Late	mausoleum	Foundation	medium	unknown	Safi ruler (local ruler)?	
Imamzada 'Imad al-Din / Khwaja 'Ali Safi mausoleum	Qum	15	1390?	Late	Dynastic tomb of Safis	Foundation	medium	Khwaja 'Ali Safi	Safi ruler (local ruler)	
Imamzada 'Ali ibn Abi al-Ma'ali ibn 'Ali Safi / Khwaja Asil al-Din mausoleum	Qum	15	1360	Late	Dynastic tomb of Safis	Foundation	medium	'Ali ibn Abi al-Ma'ali ibn 'Ali Safi	Safi ruler (local ruler)	
Farumad Friday mosque	Farumad	16	Seljuq-early Ilkhanid	Early	Congregational mosque	Rebuilding and redecoration	monumental	'Ala' al-Din Muhammad Farumadi	Ilkhanid minister	Seljuq foundation?
Khusraw Shir Friday mosque	Khusraw Shir	17	Early Ilkhanid	Early	Congregational mosque	Foundation and redecoration	medium	unknown	Ilkhanid official?	
Bistam Friday mosque	Bistam	18	Seljuq; rebuilt in early 14 th century (1306-07)	Golden	Congregational mosque	Rebuilding and redecoration	medium	unknown	The mutawwali of the mosque?	Qajar repairs
Kashana tower	Bistam	18	Early 14 th century (1300-01)	Golden	Funerary tower	Foundation	small	Sultan Uljaytu	Ruler	
Bayazid Bistami complex	Bistam	19	Pre-Seljuq; rebuilt in early 14 th century (1308-09; 1313)	Golden	Pilgrimage complex	Rebuilding and redecoration	monumental	Ghazan Khan; sultan Uljaytu	Rulers	

Jawin Friday mosque	Jawin	20	Late Ilkhani d?	Late	Congregat ional mosque	Foundation	small	unknown	Local notable?	
Abu al-Hasan al-Kharaqani mausoleum	Qala-yi Naw	21	Late Ilkhani d?	Late	Pilgrimag e complex	Foundation?	small	unknown	Ilkhanid official?	Earlier foundation likely
Marand Friday mosque	Marand	22	Seljuq; Ilkhani d (1330-31)	Late	Congregat ional mosque	Mihrab installation	medium	Husayn ibn Mahmud ibn Taj Khwaja	Ilkhanid official	Seljuq foundation
Urumiya Friday mosque	Urumiya	23	Seljuq; Ilkhani d (1277-78?)	Early?	Congregat ional mosque	Mihrab installation	medium	unknown	Ilkhanid official?	Seljuq foundation
Tabriz Friday mosque stucco mihrab	Tabriz	24	Early 14 th century	Golden	Congregat ional mosque	Mihrab installation	medium	unknown	Ilkhanid official	Earlier foundation
Pir Husayn Khanqah	Qubalıbal aoglan	25	13-14 th century	Early (mihra b and tiles)-Late	Pilgrimag e complex	Foundation and redecorations	medium	Constructi on: Hasan ibn-i Muhamm ad ibn-i Barwandi Tiles: 'Umar ibn-i Muhamm ad al-Shirzadi al-Qazwini (state official?) Stucco mihrab: unknown, reference to the ruler Fariburz III	Shirvanshah id official	'Ali al-Qasim ibn-i Mulaskh (late 14 th century repairs)
Alinja Khanqah	Khanqah	26	13-14 th century ?	Early?	Pilgrimag e complex	Rebuilding and redecoration	small	unknown	Local notable or Shirvanshah official	Earlier, Seljuq foundation
Uljaytu mausoleum	Sultaniyy a	27	Phase one 1305-06; phase two: 1313-1316/20	Golden	Imperial mausoleu m and pilgrimag e complex	Foundation and redecoration	monumental	Sultan Uljaytu; Abu Sa'id	rulers	Earlier patrons
Varamin Friday mosque	Varamin	28	1322-1325-26	Late	Congregat ional mosque	Foundation	medium	Muhamm ad ibn Muhamm ad al-Quhandi	Ilkhanid official	1418-19 and 1446-47 repairs: Ghiyas al-Din Yusuf Khwaja
Rukniyya	Yazd	29	1325	Late	Funerary complex	Foundation	medium	Morteza 'Azam Sayyid Rukn al-Din Muhamm ad ibn-i Nizam al-Din al-Husayni al-Riyazi	Muzzafarid minister	

Shamsiyya	Yazd	29	1333/1335 (1365?)	Late	Funerary complex	Foundation	medium	Shams al-Din	Muzzafarid minister	
Kamaliyya	Yazd	29	1320	Late	Funerary complex	Foundation	medium	Kamal al-Din Abu al-Ma'ali	Muzzafarid minister	
Shaykh Turbat-i Jam complex Old mosque	Turbat-i Jam	30	c. 1320	Late	Pilgrimage complex	Rebuilding and redecoration	medium	Malik Ghiyas al-Din Muhammad		Other patrons of other sections of the complex
Shaykh Turbat-i Jam complex Kirmani mosque	Turbat-i Jam	30	1328	Late	Pilgrimage complex	Rebuilding and redecoration	medium	Mu'izz al-Din Kart	Ruler of Herat	Other patrons of other sections of the complex
Kucha-yi Mir mosque	Natanz	31	Seljuq; First decades of 14 th century	Golden	Residential mosque	Rebuilding and redecoration	small	unknown	Ilkhanid official of low rank or a prominent local	Seljuq foundation
Imamzada Rabi'a Khatun	Ushurjan	32	1308-09	Golden	<i>Imamzada</i>	Foundation	small	unknown	Ilkhanid official of low rank or a prominent local	
Mir Zabir mausoleum	Sirjan	33	First decades of 14 th century	Golden	mausoleum	Foundation	medium	unknown	Ilkhanid official of low rank or a prominent local	
Sava Friday mosque Ilkhanid mihrab	Sava	34	First decades of 14 th century	Golden	Congregational mosque	Mihrab installation	small	unknown	Ilkhanid official of low rank or a prominent local	Earlier patrons
Sujas Friday mosque	Sujas	35	Seljuq (late 12 th century); Ilkhanid redecoration (late 13 th century)	Early	Congregational mosque	Mihrab redecoration	small	unknown	Ilkhanid official of low rank or a prominent local	Seljuq foundation
Imamzada Yahya	Varamin	36	1261-1263; 1265; 1305; 1307	Early (tiles)-Golden (stucco and tiles)	<i>Imamzada</i>	Foundation, rebuilding, redecoration	medium	Fakhr al-Din	Ilkhanid official	Seljuq foundation?
Imamzada Khizr	Hamadan	37	Seljuq; Ilkhanid	Late?	Sufi complex?	redecoration	small	unknown	Local authority of Ilkhanid official of lower rank	Seljuq foundation
Imamzada 'Abdullah	Gudzar	N.A.	Ilkhanid?	Golden?	mausoleum	Foundation and redecoration	medium	unknown	Local authority of Ilkhanid official of lower rank	

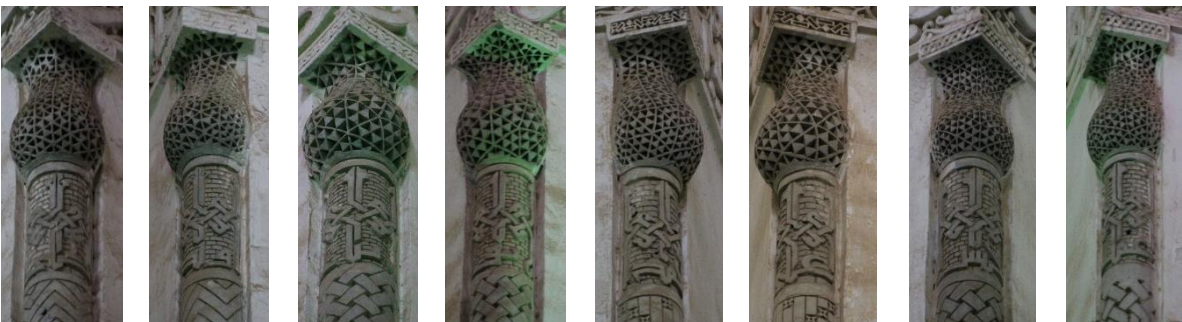
Appendix. No. 4: Signatures of Ilkhanid stucco craftsmen.

Craftsman's name	Cat. No.	Signature Date	Settlement	Monument Type	Location	Nisba	Profession	Verb
'Abd al-Mu'min ibn-i Sharafshah al-naqqash al-Tabrizi	23	1277-78	Urumiya	Congregational mosque	Mihrab	Al-Tabrizi	Al-naqqash	Work of
Muhammad ibn-i Ahmad al-Simnani	18	1300-01	Bistam	Funerary tower	Entrance portal	Al-Simnani	/	Work of
Muhammad ibn-i al-Husayn ibn-i Abi Talib al-muhandis al-banna'	18	1300-01	Bistam	Funerary tower	Entrance portal	Al-Damghani	Al-muhandis, al-banna'	Work of
Muhammad ibn-i al-Hasan ibn-i Abi Talib al-muhandis al-banna'	18	1306-07	Bistam	Congregational mosque	<i>qibla iwan</i>	Al-Damghani	Al-muhandis, al-banna'	Work of
Muhammad ibn-i al-Husayn ibn-i Abi Talib al-muhandis al-banna' al-Damghani	19	1306-07	Bistam	Pilgrimage complex	Mihrab	Al-Damghani	Al-muhandis, al-banna'	Work of
Muhammad ibn-i al-Husayn ibn-i Abi Talib al-muhandis al-banna' al-Damghani and his brother Hajji	19	1306-07	Bistam	Pilgrimage complex	Seclusion rooms	Al-Damghani	Al-muhandis, al-banna'	Work of
Hasan 'Ali Ahmad Babuya al-banna' al-Vidguli	12	1307-08	Natanz	Pilgrimage complex	Columns	Al-Vidguli	Al-banna'	Work of
Muhammad ibn-i al-Husayn al-Damghani	18	1308-09	Bistam	Funerary tower	Monumental inscription	Al-Damghani	/	Work of
Husayn ibn-i Abi Talib al-muhandis al-Damghani	18	1308-09	Bistam	Funerary tower	Monumental inscription	Al-Damghani	Al-muhandis, al-banna'	Work of
Mas'ud al-Kirmani	32	1308-09	Ushturjan	<i>Imamzada</i>	Mihrab	Al-Kirmani	/	Work of
Haydar ibn-i Asil al-Din?	12	1309-10	Natanz	Pilgrimage complex	Monumental inscription	/	/	/
Haydar	1	1310	Isfahan	Congregational mosque	Mihrab	/	/	Work of
Muhammad Shah al-naqqash	2	1312-13	Pir-i Bakran	Pilgrimage complex	Monumental inscription	/	Al-naqqash	Work of
Muhammad ibn-i al-Husayn al-jassas al-Damghani	19	1313-14	Bistam	Pilgrimage complex	Entrance portal	Al-Damghani	Al-jassas	Work of
Hajji ibn-i Husayn al-banna' al-Damghani	/	1315	Damghan	Residential mosque	<i>iwan</i>	Al-Damghani	Al-banna'	Work of
Haydar al-Kirmani	31	c. 1320	Natanz	Residential mosque	mihrab	Al-Kirmani	/	Work of
Illegible	33	1310-1325	Sirjan	mausoleum	mihrab	/	/	/
'Ali ibn-i Abu Hasan ibn-i Mahmud al-Shahristani	16	Mid 13 th century?	Farumad	Congregational mosque	<i>Qibla iwan</i>	Al-Shahristani?	/	Work of
Mahmud?	16	Mid 13 th century?	Farumad	Congregational mosque	Entrance portal	/	/	/
Mahmud?	16	Mid 13 th century?	Farumad	Congregational mosque	Small <i>iwan</i>	/	/	/
Mahmud?	16	Mid 13 th century?	Farumad	Congregational mosque	mihrab	/	/	/
'Ali al-Qazwini	28	1325-26	Varamin	Congregational mosque	Prayer hall	Al-Qazwini	/	Work of
Khawaju ibn-i Zaki ibn-i Muhammad ibn-i Mas'ud al-Kirmani	30	1312-1328	Turbat-i Jam	Pilgrimage complex	mihrab	Al-Kirmani	/	Work of
Khawaju Zaki ibn-i Muhammad ibn-i Mas'ud al-Kirmani	30	1328	Turbat-i Jam	Pilgrimage complex	mihrab	Al-Kirmani	/	Work of
Nizam al-bandigir al-Tabrizi	22	1329-30	Marand	Congregational mosque	mihrab	Al-Tabrizi	Bandigir	Work of
Hasan 'Ali ibn-i Ahmad Babuya al-banna' al-Vidguli	13	1335-36	Mahallat-i Bala	<i>Imamzada</i>	mihrab	Al-Vidguli	Al-banna'	Work of
'Ali ibn-i Muhammad ibn-i Abi Shujj'a al-banna'	15	1359-60	Qum	mausoleum	wall	/	Al-banna'	Work of
Architect's name		Signature Date	Settlement	Monument Type	Location	Nisba	Profession	Verb
Shahzada Habibullah ibn-i Shaykh Hajji Muhammad	25	1203-04	Qubalibala oġlan	Pilgrimage complex	Stone slab at the mosque entrance	/	Al-mi'mar	The architect of this building is
Hasan ibn-i 'Ali [sic] Abi al-banna'	15	1359-60	Qum	mausoleum	wall	/	Al-banna'	This building is work of

Appendix No. 5: Ilkhanid Craftsmen Signatures Mentioned in the Research – detailed information and documentation.

	
1. Ribat-i Sharaf, North-eastern Iran	
549/1154-1155	
حرر هذه الكتابة على يادي أبي منصور أسعد بن محمد الطرائفي السرخسي غفر الله له و لوالده	
This inscription was written (carved?) by (hand of) Abi Mansur As'ad ibn-i Muhammad al-Tara'ifi al-Sarakhsi, May God pardon him and his children TEI 34503.	
	
2.a 'Abd al-Samad complex, Natanz	2.b 'Abd al-Samad complex, Natanz
699/1299-1300?	699/1299-1300?
عمل حسن على بن احمد با بويه البناء	في شوال تسع و ... بخط العبد الضعيف على محمد بن فضل الله
Work of Hasan 'Ali ibn-i Ahmad Babuya al-banna'	In Shawwal nine and [sic] bi-khatt-i (in the writing of) the poor slave 'Ali Muhammad ibn-i Fazlallah al-[sic]
RCEA, XIII, n° 5126.	Blair 1986b, 394.
	
3.a Imamzada Yahya, Varamin	3.b Imamzada Yahya, Varamin
705/1305	705/1305
صنع على بن احمد بن علي الحسيني كاتبني	عمل يوسف على بن محمد
Produced by 'Ali ibn-i Ahmad ibn-i 'Ali al-Husayni the Writer [sic]	Work of Yusuf 'Ali ibn-i Muhammad
TEI 34435.	RCEA, XIII, n° 5195.
	
4.a Ushturjan Friday mosque	4.b Ushturjan Friday mosque
715/1315-16	715/1315-16
عمل حاجي محمد قطاع تبريزي	عمل بناء احمد بن محمد البناء المعروف حداد

Work of Hajji Muhammad qitta'-i Tabrizi TEI 35457.	Building work of Ahmad ibn-i Muhammad al-banna' al-ma'ruf-i Haddad. TEI 35455.
	
5. Pir-i Hamza Sabzpush mausoleum, Abarquh second half of 6 th /12 th c. عمل محمد بن ابي الفرج العراقي غفر الله له	6. Zuzan mosque 5-6 th /11-12 th c. عمل ابو سعد بن محمد الساريان
Work of Muhammad ibn Abi al-Faraj al-'Iraqi, may God forgive him Karimy and Holakooei 2015, 400-02.	Work of Abu Sa'id ibn-i Muhammad al-Sarban Adle 2015, 255-56.
	
7. Urumiya Friday mosque 676/1277-78? عمل عبد المؤمن بن شرفشاه النقاش التبريزي	8.a Bistam Friday mosque 706/1306-07 عمل محمد بن الحسين بن ابي طالب المهندس البنا الدمغاني
Work of 'Abd al-Mu'min ibn-i Sharafshah al-naqqash al-Tabrizi RCEA, XII, n° 4755.	Work of Muhammad ibn-i al-Hasan ibn-i Abi Talib al-muhandis al-banna' RCEA, XIII, n° 5155.
	
8.b Burj-i Kashana 700/1300-01 عمل محمد بن احمد السمناني	8.c Burj-i Kashana 700/1300-01 عمل محمد بن الحسين بن ابي طالب المهندس البنا
Work of Muhammad ibn-i Ahmad al-Simnani RCEA, XII, n° 4492.	Work of Muhammad ibn-i al-Husayn ibn-i Abi Talib al-muhandis al-banna' Salihi and Taghavinejad 2017, 90-91.
	
	
8.d Burj-i Kashana	8.e Burj-i Kashana

708/1308-09	708/1308-09
عمل محمد بن الحسين الدامغاني	عمل حسين بن أبي طالب المهندس الدامغاني
Work of Muhammad ibn-i al-Husayn al-Damghani Blair 1982, 266-67.	Work of Husayn ibn-i Abi Talib al-muhandis al-Damghani Blair 1982, 266-67.
	
9. Imamzada Rabi'a Khatun, Ushturjan (National Archaeological museum Teheran)	8.f Bayazid Bistami complex, Uljaytu portal
708/1308-09	713/1313-14
عمل مسعود كرماني	عمل محمد بن الحسين جصاص الدامغاني
Work of Mas'ud [al-]Kirmani O'Kane 1992, 87.	Work of Muhammad ibn-i al-Husayn [al-]jassas al-Damghani RCEA, XIV, n° 5328.
	
8.g Bayazid Bistami complex, Ilkhanid mosque	8.h Bayazid Bistami complex, seclusion rooms
706/1306-07	706/1306-07
عمل محمد بن الحسين بن أبي طالب المهندس بقاء الدامغاني غفر الله له ولوالديه وللمؤمنين والمؤمنات	عمل محمد بن الحسين بن أبي طالب المهندس البناء الدامغاني وأخوه حاجي
Work of Muhammad ibn-i al-Husayn ibn-i Abi Talib al-muhandis [al-]banna' al-Damghani, may God bless him, his family and the believers RCEA, XIV, n° 5329.	Work of Muhammad ibn-i al-Husayn ibn-i Abi Talib al-muhandis al-banna' al-Damghani and his brother Hajji Blair 1982, 264.
	
2. c 'Abd al-Samad complex, shrine, Natanz	
707/1307-08	عمل حسن علي احمد بابويه بنا ويدگلي
Work of Hasan 'Ali Ahmad Babuya [al-]banna' [al-]Vidguli McClary and Grbanovic 2021, 19. Blair, personal communication to the Author.	

	
2. d 'Abd al-Samad complex, Friday mosque, Natanz 709/1309-10	10. Kucha-yi Mir mosque, Natanz c. 720/1320
حیدر بن اصیل (?) الدین	عمل حیدر کرمانی
Haydar ibn-i Asil al-Din? Blair 1986b, 61.	Work of Haydar [al-]Kirmani O'Kane 1992, 87.
	
11. Isfahan Friday mosque, Uljaytu mihrab, Isfahan 710/1310	12. Pir-i Bakran mausoleum, Pir-i Bakran 713/1312-13
عمل حیدر	عمل محمد شاه نقاش
Work of Haydar Hunarfar 1966, 120.	Work of Muhammad Shah [al-]naqqash Grbanovic 2017a, 68.
	
13. Mosque ruin, Pir-i Alamdar tower, Damghan (no longer extant) c. 715/1315	14. Mir Zabir mausoleum, Sirjan c. 710-25/1310-25
عمل حاجی بن الحسین البنا الدامغانی	illegible
Work of Hajji ibn-i Husayn al-banna' al- Damghani Blair 1982, 264.	N.A.
	
15.a Farumad Friday mosque Mid- 13 th century?	15.b Farumad Friday mosque, entrance portal Mid- 13 th century?
عمل علی بن ابو حسن بن محمود الشهرستاني	[sic] محمود [sic]
Work of 'Ali ibn-i Abu Hasan ibn-i Mahmud al-Shahristani	[sic] Mahmud [sic]

https://iranicaonline.org/articles/faryumad (Last Accessed: August 29, 2020)	Author's reading.
	
15.c Farumad Friday mosque, small <i>iwan</i> Mid- 13 th century?	16. Varamin Friday mosque, eastern prayer hall 726/1325-26
[sic] محمود [sic]	عمل علی قزوینی خدایش بیامرزاد
[sic] Mahmud [sic] Author's reading.	Work of 'Ali [al-]Qazvini, may God bless him L. Kalus; TEI 3428.
	
17. Marand Friday mosque, 731/1329-30	18.a Shaykh Ahmad Jami complex, Kirmani mosque between 712/1312-13 and 728/1327-28
عمل العبد الفقير نظام بندگان تبریزی	عمل عبد الضعیف التحدیف الراجی الی رحمہ رب العزیز خواجو بن زکی بن محمد بن مسعود کرمانی
Work of the Poor Slave Nizam [al-]bandigir al-Tabrizi RCEA, XV, n° 5615.	Work of the weak, poor slave, who hopes in the mercy of the God, Khwaju ibn-i Zaki ibn-i Muhammad ibn-i Mas'ud [al-]Kirmani RCEA, XVI, n° 6144 bis.
	
18.b Shaykh Ahmad Jami complex, courtyard between 712/1312-13 and 728/1327-28	19. Imambada Yahya wa Fazl, Mahallat-i Bala 735/1335-36?
عمل المسکین المستکین الحافی خواجو زکی بن محمد بن مسعود الکرمانی	عمل حسن علی احمد بابویه بنا ویدگلی
Work of the poor person, Khwaju Zaki ibn-i Muhammad ibn-i Mas'ud al-Kirmani O'Kane 1992, 89.	Work of Hasan 'Ali ibn-i Ahmad Babuya al-banna' al-Vidguli McClary and Grbanovic 2021, 19.

	
20.a Imamzada ‘Ali ibn-i Abi al-Ma‘ali ibn-i ‘Ali Safi	20.b Imamzada ‘Ali ibn-i Abi al-Ma‘ali ibn-i ‘Ali Safi
761/1359-6	761/1359-6
عمل علي بن محمد بن ابي شجاي بنا	هذه العمارة بعمل حسن بن علي [sic] ابي البناء وكتب في رجب ٧٦١
Work of ‘Ali ibn-i Muhammad ibn-i Abi Shujj‘a [al-]banna’ Tabataba‘i 1973, 37.	This building is work of Hasan ibn-i ‘Ali ... Abi’ al-banna’ and it is written in Rajab 761 Hillenbrand 2014, 75.
	
21. Na‘in Friday mosque minbar	
711/1311	
عمل الأستاذ افتخار الصنّاع محمود شاه بن محمد النقّاش الكرمانى بخطّ العبد الحكيم المحمدي	
Work of the Master, Pride of Crafts, Mahmudshah ibn-i Muhammad al-naqqash [al-]Kirmani, written by al-‘Abd al-Hakim al-Muhammadi RCEA 0711.	

Chapter Five: Stucco Craftsmen's Workshop and its Artistic Notion

Introduction

This chapter provides information concerning the intellectual process behind the production of stuccos termed here as the artistic notion of craftsmen's workshops.⁹⁰³ This is achieved by pinpointing specific characteristics of stuccos which were observed during their documentation. The main premise of this discussion is that the intangible artistic notion of Ilkhanid stucco craftsmen can be understood based on the examination of the monuments and their architectural revetment repertoires. This allows the better comprehension of the craftsmen's logic and the intellectual process which took place for the production of architectural revetments and their function and meaning in their architectural context. Certain attitudes of craftsmen towards the production of stuccos are informative of the craftsmen's perception of the works they produced, and by extrapolation, the perception of the revetments by the faithful. This discussion also enables the proposition of hypotheses concerning the craftsmen's workshop composition by examining the stucco revetment production process. The discussion of craftsmen's artistic notions provides for significant insight into the hierarchy between the revetment media, craftsmen's mobility and the transfer of stucco production knowledge. It is however beyond the scope and feasibility of this research to discuss works on perception and works concerning aesthetics of other media of Islamic art.

5.1 The Hierarchy between Architectural Revetment Media

Background

Ilkhanid decoration and redecoration interventions were performed with diverse artistic media, such as carved stucco, lustre tiles, glazed tiles, wall painting, applied moulded stuccos or applied moulded and stencilled stuccos. These media could also be combined for redecoration interventions, but more frequently, a decorative or redecoration intervention comprised production of revetments in a single medium, because it was performed by one craftsmen's workshop which possessed an expertise in one decorative medium. For example, at the Pir Husayn Khanqah (Cat. No. 25) the redecoration interventions in lustre tiles and carved stuccos were performed as two separate and chronologically distinct activities. Similar is observed at the 'Abd al-Samad complex (Cat. No. 12) where carved stuccos were employed for the first redecoration and the lustre tiles for the second redecoration intervention. At Turbat-i Jam (Cat. No. 30), the redecoration of the Gunbad structure was performed on a large scale and exclusively in wall painting medium.

Only occasionally did decorative interventions comprise production of architectural revetments out of more than one medium. If so, the multitude of decorative media often signalled the prestige of the intervention sponsorship and extensive dimensions of the repertoire. For the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), the first decorative stage comprised revetments consisting of glazed and terracotta elements and the second stage redecoration consisted of glazed tile dado and combination of applied moulded and stencilled stuccos and wall painting media. Although of medium dimension, the Pir-i Bakran mausoleum (Cat. No. 2) was redecorated twice soon after its construction. The third decorative stage comprised application

⁹⁰³ The artistic notions of stucco craftsmen's workshops is intended as a totality of intellectual processes and craftsmen's self-consciousness which are tied to the production of stuccos and their final aesthetic characteristics.

of some 30,000 tiles on its surfaces and production of carved stuccos, wall paintings and applied moulded stuccos.

a.) Revetment Media Technological Characteristics

Research of the decorative repertoires of Ilkhanid monuments illustrates that each decorative medium possesses its own technical characteristics, which largely determined its use in architectural spaces. Four main factors could be discerned in this respect: revetment durability (resistance to atmospheric agents), revetment dimensions, cost of production and speed of production. In addition, another important factor is the availability of craftsmen. Revetment media such as terracotta and glazed tiles are the most resistant to weathering; they were employed to cover the exteriors of monuments. Some examples are: the redecoration of the northern entrance portal of the Ushturjan Friday mosque (Cat. No. 4), the portal of the no longer extant *khanqah* of the 'Abd al-Samad complex (Cat. No. 12) the Uljaytu portal of the Bayazid Bistami complex (Cat. No. 19) and the entrance portal of the Varamin Friday mosque (Cat. No. 28). In fact, use of glazed and terracotta elements and glazed tiles for the first decorative stage of the Uljaytu mausoleum (Cat. No. 27), in this respect, demonstrates an immense prestige of the commission, because it was not necessary to employ such revetments on the monument's interior. These cases illustrate that only focal parts of monument exteriors, such as entrance portals, *iwans*, domes and façades were revetted, rather than the entire exteriors of buildings. Differently to the described examples, monument interiors were more frequently decorated or redecorated in carved stucco, wall painting, and applied moulded and stencilled stucco. These revetment media are more sensitive to atmospheric agents, such as sun light and especially precipitation. Lustre tiles were mainly employed for interior decorations or redecorations, due to their cost and because lustre material was sensitive to atmospheric agents. Occasionally, glazed and terracotta element compositions were also employed in interiors, but on a more reduced scale.

b.) Revetment Media and the Hierarchy of their Use

Tile Revetments

Three main types of revetments connected to glazed tiles have been recorded for the Ilkhanid period: tiles (in lustre, moulded and glazed, and Lajvardina artistic techniques), combinations of glazed and terracotta elements and tile mosaic.⁹⁰⁴

Use of glazed media for monument decoration is not an Ilkhanid invention. Evidence from several monuments in the Anatolian territory indicates that tiles in lustre and occasionally Mina'i technique were employed on monuments of Seljuq Anatolia.⁹⁰⁵ But during the Ilkhanid period, use of tiles, in lustre, Lajvardina, and glazed and moulded techniques reached an unprecedented frequency in occurrence. Most lustre tiles were produced in the city of Kashan, where the families of lustre potters were stationed.⁹⁰⁶ It is not clear if production of Lajvardina

⁹⁰⁴ The most complete publication on the subject is Pickett's monograph. Further discussion of tile revetments is provided by Watson. Research focusing on glazed revetments of the Takht-i Sulayman summer palace is by Masuya and Quchani. See Pickett 1997; Watson 1975; Watson 1985; Quchani 1992; Quchani 2011; Masuya 1997; Masuya 2019.

⁹⁰⁵ For example, at the Kilij Arslan kiosk in Konya. See McClary 2017, 23-38. Lustre, monochrome and black over turquoise tiles were excavated from the Kubadabad palace in Beyshehir (built under 'Ala al-Din Kaykubad). See Arik 2000. See also Meinecke 1976, Vol. 1, 5-71.

⁹⁰⁶ Evidence of excavated kiln remains at the site of Takht-i Sulayman indicates that the craftsmen might have been mobilized to the site to produce there some of the custom-made revetments for the palace. For lustre tiles,

tiles, a specific technique of glazed and gilded tiles, invented in the Ilkhanid period, was also the prerogative of Kashan potters or if its production was separate and more widespread.⁹⁰⁷

Technical characteristics of the production process for the revetments determined the scale on which they could be employed. Production of lustre tiles required specific technology (firing of lustre in a special reduction atmosphere kiln), resources (wood for several firings), know-how (production of lustre material) and time (several stages of production). Accordingly, lustre tiles were employed on a smaller scale and for focal points of monument interiors. They were most frequently employed for decoration or redecoration of cenotaphs, the dado areas, inscription friezes and mihrabs. Some examples of these revetments are the tiles which used to decorate the 'Abd al-Samad shrine (Cat. No. 12): the cenotaph tiles, the two mihrabs and the dado area with an inscription frieze. Similar use of tiles was also observed at the Imamzada Yahya of Varamin (Cat. No. 36) where they were employed for redecoration of the interior (the large mihrab, the cenotaph and the dado area). In both cases, lustre tiles were not part of the original decorative programme, and they were integrated into it in several phases. The modality of application of lustre tiles, by the means of mortar adhesion, was not technically demanding, and this rendered the medium suitable for redecoration campaigns. The appreciation of aesthetics and of the demanding production process for lustre tiles is reflected in the practice of tile reuse.⁹⁰⁸ The small dimensions of the tiles determined their geographical distribution, as they could be transported over large distances from the production centre in Kashan. Kashan lustre tiles were employed for redecoration of monuments at the 720 km distant Khanqah of Pir Husayn (Cat. No. 25) or the 530 km distant *imamzada* on the Kharg island.⁹⁰⁹ Geographical distribution of carved stucco, wall painting, and applied moulded and stencilled stuccos was different, because it depended on craftsmen's mobility and the availability of gypsum material for stucco production.

This research shows that lustre tiles were re-employed for revetments of the dado area at the Pir Husayn Khanqah (Cat. No. 25) and the Lajvardina tiles were likely reused to redecorate the interior of the Pir-i Bakran mausoleum (Cat. No. 2). The described tile reuse phenomenon was more frequent, compared to what has been acknowledged and it requires further research.⁹¹⁰

Glazed Architectural Revetments

The combination of terracotta and glazed elements (forming strapwork revetment designs) was inherited by Ilkhanid craftsmen from their predecessors, as indicated by the pre-Ilkhanid monuments of north-western Iran and Nakhchivan, as well as Anatolia.⁹¹¹ Ilkhanid craftsmen nevertheless developed new designs and ornamental compositions for strapwork, which formed

which required specific types of kilns and firing (in a reduction atmosphere for lustre), the only evidence of their production was found in Kashan and not at any other site.

⁹⁰⁷ Use of related artistic techniques of architectural revetments of the mausolea in the Shah-i Zinda complex in Samarkand indicate that such tiles were likely produced in other geographical and chronological contexts. For the monograph of the subject of this funerary complex, see Marefat 1992.

⁹⁰⁸ See Donabédian and Porter 2017.

⁹⁰⁹ These are linear distances. For the Imamzada Muhammad at Kharg island, see Wilber 1955, 184.

⁹¹⁰ Watson does not discuss the tile reuse phenomenon in his landmark monograph on Lustre tiles from 1985. Perhaps the earliest study mentioning tile reuse is by Kratchkovskaya (See Kratchkovskaya 1946). Recent research had shown that tile reuse was more frequent than what has been acknowledged. See Donabédian and Porter 2017.

⁹¹¹ For example, the Mu'mina Khatun mausoleum in Nakhchivan (1175-86), the Gunbad-i Qabud in Maragha (1196-97), the Karatay madrasa in Konya (1251-52) or the later Aslanhane mosque mihrab in Ankara (1289). For the Mu'mina Khatun mausoleum see Aslanapa 197, 67-77; for Gunbad-i Qabud see Bier 2012. For the Aslanhane mosque see Meinecke 1976, Vol. 2, 66-73 and for the Karatay madrasa see Meinecke 1976, Vol. 2, 283-298.

a distinct Ilkhanid style, as illustrated by repertoires of the Ushturjan Friday mosque (Cat. No. 4), the 'Abd al-Samad complex at Natanz (Cat. No. 12), the Bayazid Bistami complex at Bistam (Cat. No. 19) and the first decorative phase of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27).⁹¹² From these monuments, the double signature on the Ushturjan Friday mosque's northern entrance portal indicates that tile cutters, or tile craftsmen collaborated closely with groups of builders in producing the coating for the rebuilt portal. The *nisba* of the tile-cutter who signed the Ushturjan portal, *al-Tabrizi*, suggests that the main origin of these craftsmen could have been Tabriz. Tabriz was one of the main production centres of glazed revetments in diverse artistic techniques and media also in the post-Ilkhanid (Aq Quyunlu) period.⁹¹³

The technique of tile mosaic could have been an Ilkhanid invention; it came to be employed on monuments of the Golden and Late Ilkhanid periods, but it fully flourished in post-Ilkhanid times, in the Muzaffarid, Aq Quyunlu and Timurid Empires.⁹¹⁴ The early tile mosaics featured a restricted colour palette, consisting of different shades of blue and white. The earliest dated remains of tile mosaic *in situ* are parts of the second decorative programme of the Uljaytu mausoleum at Sultaniyya (the second decorative phase dates to 1310-1316/20; Cat. No. 27). Tile mosaic was frequently employed for funerary structures in north-western Iran and the area of Caucasus.⁹¹⁵ Moreover, fragmental remains of such revetments have been recovered from archaeological sites, such as the Rashidiyya in Tabriz, but they are difficult to date exactly and they might originate from other structures in Tabriz.⁹¹⁶ The tile mosaic artistic medium reached its apex under the Muzaffarids (for example in the Yazd Friday mosque)⁹¹⁷ and especially in the Aq Quyunlu and Timurid periods.⁹¹⁸ This artistic technique comprised formation of tile mosaic compositions out of specifically cut monochrome tiles in variety of colours, which was achieved with the aid of paper stencils placed on every tile to enable their cutting. These elements of mosaic were assembled upside down and bound together with gypsum mortar and these panels of revetments were attached to architectural surfaces. The invention of *tarkh* (a curved support, mimicking the curvatures of the dome's interior or exterior, which facilitated preassemblage and application of tile mosaic onto curved surfaces) could have been invented in conjunction with the need to decorate the domed structures with tile mosaics or compositions out of glazed and terracotta elements.⁹¹⁹

Carved Stucco Revetments

Unlike tiles, carved stuccos had to be produced *in situ*. This research of carved stucco artistic techniques and production process (see Chapter 3, Section 3.1) demonstrates that carved stuccos were not produced with the use of stencils but that craftsmen employed smaller drawings and sketches for design transfer into the stucco medium. Each craftsmen's workshop retained their

⁹¹² Many of these repertoires (Ushturjan, Natanz, Varamin and Sultaniyya) were likely works of the same craftsmen's workshops.

⁹¹³ Sandra Aube, Ceramic tile decoration in 15th-century Tabriz, paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021. See also Aube 2017.

⁹¹⁴ See, for example, Aube 2017.

⁹¹⁵ Such as the tomb tower at Barda, dated 1322 and the Qarabağlar mausoleum in Nakhchivan (first half of 14th century). For the Barda tower see Aslanapa 1979, 93-97; Wilber 1955, 159. For the Qarabağlar mausoleum see Azerbaijan Respublikası and Nakhchivan Muxtar Respublikası 2018.

⁹¹⁶ Babaylou and Motmaen, Tileworks Typology of Tabriz before Turkmens, paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

⁹¹⁷ Pope and Ackermann 1977[1938-39], Vol. 3, 1091-1093; <https://archnet.org/sites/1691> (Last Accessed: April 19, 2021).

⁹¹⁸ See Aube 2017.

⁹¹⁹ This is the author's hypothesis.

production technology, skills and repertoire of artistic techniques and designs, which it employed for production of carved stuccos. The research also indicates that stucco workshops were not randomly itinerant in search of commissions. Rather, they were summoned for each project.⁹²⁰

Research and the proposed taxonomy of carved stucco artistic techniques (see Chapter 3, Section 3.1) indicate that many techniques required the craftsmen to carve several subsequently applied layers of stucco material to produce deeper stucco reliefs. This technical characteristic of carved stuccos prevented the craftsmen from the use of stencils. The fact that stencils could not be employed for carved stucco making slowed down their production process, compared to wall paintings and applied moulded and stencilled stuccos. Accordingly, carved stuccos were frequently employed for smaller or medium size revetment programmes, rather than more extensive decorative repertoires. Carved stuccos were mainly employed for the production of mihrabs, inscription friezes, dado areas and limited dimension stucco panels. Less frequently, they were also employed to cover larger scale surfaces of supporting walls, such as in the case of the Seljuq carved stucco repertoire in the interior of the Gunbad-i 'Alawiyan in Hamadan.⁹²¹ The practice of covering entire interiors in carved stuccos was particularly widespread in the Qum area (Cat. No. 15). This technical and aesthetic practice is an exception, and it should be considered as characteristic of monuments in the Qum area and the craftsmen's workshops which operated there. Less frequently, carved stuccos were employed for large-scale redecoration programmes. An important example is provided by the last decorative stage in carved stucco at the Farumad Friday mosque (Cat. No. 16) which was produced in the Early Ilkhanid period.⁹²²

Wall Paintings combined with Applied Moulded and Stencilled Stuccos

This research demonstrates that wall painting and applied moulded and stencilled stucco repertoires, such as those of the second decorative phase at the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) and the programmes of funerary complexes in Yazd (Cat. No. 29), were produced with the aid of stencils.⁹²³ The use of moulds and stencils for applied moulded and applied stencilled stuccos rendered their production process more effective. These revetments could be prepared on the ground and partially pre-fabricated. Subsequently, they needed to be applied on the architectural surfaces and rendered polychrome. These technological characteristics reduced the necessary time for the production of revetments and their cost.

The lower cost, the possibility of (partial) pre-fabrication, the ease of design transfer and shorter production times for wall paintings and applied moulded and stencilled stuccos, determined these revetments as most suitable for decoration of more extensive architectural surfaces, which could be elevated and concave or convex. As illustrated by the mausolea revetments in Yazd (Cat. No. 29) wall paintings or applied moulded and stencilled stuccos could be employed for

⁹²⁰ This is exemplified by the monuments in remote locations, where the craftsmen would not have arrived by chance: the carved stucco mihrab at the Baba Afzal mausoleum at Maraq (Cat. No. 14), the mihrab of the Nushabad 'Ali mosque, the mihrab of the Miyandih mosque at Qamsar, the mihrab of the Jawin Friday mosque (Cat. No. 20) and the mihrab of the Alinja Khanqah (Cat. No. 26).

⁹²¹ See Shani 1996.

⁹²² Research of craftsmen's signatures and their location on the Farumad monument illustrates that this extensive redecoration campaign was divided into segments of work and that it was produced in at least four parts.

⁹²³ For discussion of applied moulded and stencilled stuccos, see the catalogue entries number 27 and 29. For further literature on this separate artistic technique(s), for which it was beyond the feasibility of this research to discuss it further, see Alvandiyani 2010 and Alvandiyani 2012.

extensive revetment repertoires of the interiors of these three funerary complexes. These characteristics rendered them perhaps best suitable also for the redecoration of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27). The redecoration of the mausoleum could be performed relatively quickly. Moreover, the transitional zone area and especially the interior of the dome of Sultaniyya were easier to decorate with a combination of applied moulded stuccos and wall paintings, rather than carved stuccos or any kind of tile revetments.⁹²⁴

Craftsmen's Availability Impact on the Revetment Media Hierarchy

This discussion sustains that technological characteristics of production of revetment media determined the modality of their use in terms of scale, location and types of revetments.⁹²⁵ This also impacted the function and the meaning of revetments. Another very important factor behind the choice of revetment media for a decorative or redecoration campaign was the availability of craftsmen. The study of the monuments for this research illustrates that some redecoration campaigns were determined by the availability of craftsmen. Similar interventions in diverse monuments were performed with distinct revetment media. Two important examples are provided by the lustre tile redecoration of the dado area at the shrine of 'Abd al-Samad at Natanz (Cat. No. 12) and the carved stucco dado area of the interior of the *iwān* of the Pir-i Bakran mausoleum (Cat. No. 2). These two cases illustrate that a redecoration revetment medium could be interchangeable up to a certain extent. In these cases, the redecoration medium was determined by the craftsmen available, rather than an aesthetics' predilection for a certain medium. This interchangeability of revetment media is also reflected in Ilkhanid mihrabs, which one finds produced out of lustre tile, carved stucco, wall painting and applied moulded and stencilled stucco media.

Conclusion

Examination of the use of architectural revetment media for decoration and redecoration interventions allows some conclusions to be drawn concerning the hierarchy of revetment media in the interiors of Ilkhanid monuments. It has been shown that the choice of decorative medium and the hierarchy between the media was determined by their technical properties, their suitability for interventions and the availability of craftsmen. The hierarchy between decorative media was thus not a result of craftsmen's choices or aesthetic predilections which would constitute for their artistic notion, but above all by technical properties of decorative media. Nevertheless, craftsmen possessed the knowledge of use of decorative media for diverse types of decorative interventions and they integrated revetments into architectural contexts according to a clear logic. Further observations indicate that more extensive revetment repertoires were produced with the decorative media which could be produced with less labour and in a shorter time period. Such parallel developments can be observed also in other chronological and geographical contexts.⁹²⁶

⁹²⁴ Application of pre-fabricated moulded stuccos and stencilling of wall paintings in the interior surfaces of the dome of the mausoleum did not require any advanced technological or construction mechanisms, apart from the presence of the scaffolding in the mausoleum's dome area.

⁹²⁵ Aesthetic preferences, patrons' choices and technique prestige played a minor role in this respect.

⁹²⁶ Stuccos in the Maghreb (Marinid period) were produced with less demanding stucco techniques, which enabled design transfer with stencils and dust sprinkling and thus faster production of stuccos, which however determined their distinct visual characteristics. In Anatolia strapwork revetments in glazed and terracotta elements of the Seljuq period slowly gave way to the use of tiles in the Ottoman period.



The Uljaytu mausoleum at Sultaniyya.



The first decorative stage: ceramic revetments.



Two phases of architectural revetments at the mausoleum.



The second decorative stage: applied moulded stuccos.

Figure 75: Decoration and redecoration of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27).

5.2 Monuments and their Revetment Repertoires: Decoration versus Redecoration

Figs. 75-76.

a.) Characteristics of Ilkhanid Redecoration Campaigns

Perhaps the most discussed example of a redecorated monument is the Uljaytu mausoleum at Sultaniyya (Cat. No. 27). The monument began to be built in the early fourteenth century and it was entirely redecorated after only a short time. The mausoleum poses challenge to the researchers, who mainly debate the reasons behind the redecoration of the monument. This research of Ilkhanid monuments however demonstrates that the redecoration activities were considerably more frequent, compared to what is being acknowledged.⁹²⁷ Out of the analysed fifty monuments, 50% were redecorated.

Frequent occurrences of redecorations during the Ilkhanid period seem surprising at first glance, but it is logical. The Ilkhanids rebuilt and redecorated earlier extant structures from the Seljuq and Early Islamic periods and employed them as parts of their urban infrastructure.⁹²⁸ Some examples are the rebuilding and redecoration activities documented on monuments of the Isfahan area, such as the Friday mosque of Haftshuya (Cat. No. 3), the Ushturjan Friday mosque (Cat. No. 4), the Gar Friday mosque (Cat. No. 7) and the Pa Minar mosque at Zavara (Cat. No. 6). These monuments were either built in the Early Islamic or Seljuq period. They were subjected to further Ilkhanid rebuilding activities when they were also decorated with carved stucco repertoires or revetments in other media. In some cases, such as at the Friday mosque of Ushturjan (Cat. No. 4), monuments have so far been understood as works of a single

⁹²⁷ See, for example the discussion of the Ushturjan Friday mosque by Miles, or the question of chronology of the Bistam Friday mosque and the Kashana tower by Hillenbrand. This attitude is well reflected in Wilber's catalogue of monuments. Miles 1974; Hillenbrand 1982; Wilber 1955.

⁹²⁸ Similar is observed for the pre-Ilkhanid and post-Ilkhanid periods.

constructive and decorative campaign,⁹²⁹ but in fact they were built and (re)decorated in several phases. This phenomenon was widespread also in other regions of Iran, as demonstrated by the research findings concerning the Ilkhanid redecoration of the Seljuq Sujas Friday mosque (Cat. No. 35), the Farumad Friday mosque (Cat. No. 16), the Marand Friday mosque (Cat. No. 22), the Urumiya Friday mosque (Cat. No. 23) and the Imamzada Yahya in Varamin (Cat. No. 36). In other cases, such as at the 'Abd al-Samad complex in Natanz (Cat. No. 12), monuments pre-date the Ilkhanid period rather than being Ilkhanid foundations - they were only rebuilt and redecorated in the Ilkhanid period.

This research proposes that it was characteristic of the Ilkhanid period for monuments to undergo several redecoration campaigns in a short time span. Perhaps the most significant example is the mausoleum of Pir-i Bakran (Cat. No. 2) with at least three Ilkhanid decorative stages. Further examples include: the Khanqah of Pir Husayn (Cat. No. 25), the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) and the 'Abd al-Samad complex in Natanz (Cat. No. 12). The two decorative interventions at the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), have been understood as two separate interventions which took place between 1305-06 and 1313-14 (phase one: the original decorative intervention) and between 1313-14 and 1316/20 (phase two: the redecorative intervention).⁹³⁰ The examination of the monument for this research provides new evidence (observation on the location of revetments, scaffolding remains and relation between two phases of revetments and the scaffolding remains) sustaining that the redecoration intervention of the mausoleum included the interruption of the original repertoire production and that there never was an actual break between the two decorative phases.⁹³¹

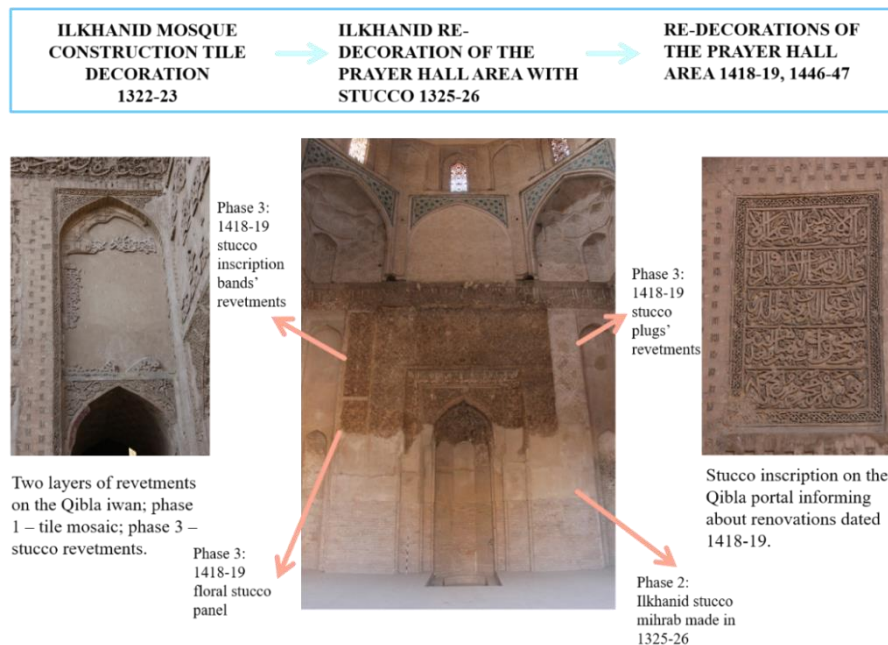


Figure 76: Decorative phases in the area of the domed prayer hall of the Varamin Friday mosque (Cat. No. 28).

⁹²⁹ See Miles 1974.

⁹³⁰ Blair 2014, 122-127.

⁹³¹ Observations of scaffolding remains in other monuments also aided at distinguishing between the decorative and redecorative interventions. For example, at the Baba 'Abdullah mausoleum at Gudzar and the Sayyidun Gul-i Surkhi mausoleum in Abarquh (Cat. No. 11), the scaffolding remains indicate that the revetments in their interior are contemporary to the construction of monuments.

Moreover, numerous Ilkhanid monuments had an afterlife after the dissolution of the Ilkhanid Empire, when they had undergone further modifications or redecorations. Perhaps the most illustrative, but also the most ambiguous example is the monumental carved stucco mihrab of the Urumiya Friday mosque (Cat. No. 23). Other examples include Safavid modifications of the Kuhpaya Friday mosque mihrab (Cat. No. 8), a redecoration of a cenotaph at the Baba ‘Abdullah complex in Na’in (Cat. No. 9), the whitewashing of the interior of the shrine of ‘Abd al-Samad complex at Natanz (Cat. No. 12), the redecoration of the *qibla iwan* and perhaps the interior of the monumental domed prayer hall of the Varamin Friday mosque (Cat. No. 28) and the repairs to the stuccos of the Khizr mausoleum in Hamadan (Cat. No. 37). In some instances, post-Ilkhanid historic modifications of decorative repertoires could also cause damage to decorative repertoires. Such is the case in the removal of lustre tiles from the Friday mosque and the shrine of ‘Abd al-Samad complex in Natanz (Cat. No. 12), the Imamzada Yahya in Varamin (Cat. No. 36) and in numerous other monuments. The worst however are acts of deliberate destruction of revetment repertoires, such as the damage inflicted on the monumental carved stucco mihrab of the Kashan Friday mosque, due to its inexact *qibla* orientation. These cases of redecoration interventions demonstrate how the constructive and decorative chronology of Islamic monuments in Medieval Iran often span pre-Ilkhanid to post-Ilkhanid periods due to their functionality which determined their constant modifications and redecorations. This is similar to significant monuments in other geographical and chronological contexts.⁹³²

b.) Impact of Redecoration Campaigns

Figs. 77-78.

Four distinct impacts of Ilkhanid redecoration interventions have been discerned during the course of this research: aesthetic change, sanctification of architectural loci, transformation of function of architectural space and change of epigraphic content, and consequently change of function and meaning of the revetment repertoire.

Aesthetic Changes

Aesthetic change of a monument’s revetment programme through redecoration occurs in every case of redecoration. It consisted of a change of the totality of visual characteristics of the monument’s revetments. The earlier discussion illustrates that the redecoration medium choice was impacted by numerous factors, such as dimensions of the repertoire, costs, speed of revetment production and types of architectural surfaces to be redecorated and craftsmen’s availability. This often caused a change of the decorative medium between the original revetments and the redecoration intervention which determined the inevitably different aesthetic appearance of new revetment programmes. Some examples of such redecorations include: the change from wall painting to carved stucco medium for the production of the monumental mihrab in the north-western hypostyle prayer hall of the Kashan Friday mosque, the change from glazed tile and terracotta compositions of strapwork to wall painting and applied moulded and stencilled stucco revetments at the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), or the change from stucco plugs to lustre tiles and carved stuccos at the shrine of ‘Abd al-Samad in Natanz (Cat. No. 12).

⁹³² A good example is the Great mosque of Damascus. See Creswell 1989, 46-73.

SELJUQ FRIDAY MOSQUE CONSTRUCTION
around 1280



ILKHANID MIHRAB INSTALLATION
Late 13th century



The Sujas Friday mosque, near Sultaniyya

Detail of two phases of the mihrab;
Seljuq and Ilkhanid.

Figure 77: Two decorative phases of the carved stucco mihrab in the main domed prayer hall of the Sujas Friday mosque.

The inevitable aesthetic change between original revetments and those of redecoration occurred also if the revetment medium did not change. This is illustrated by the case of the Ilkhanid redecoration of the carved stucco mihrab at the Sujas Friday mosque (Cat. No. 35), the two layers of stuccos at the Pir-i Bakran mausoleum (Cat. No. 2) and several layers of stuccos at the Farumad Friday mosque (Cat. No. 16). The aesthetic change occurred due to the fact that every craftsman's workshop possessed its own modality of carved stucco production and unless an original stucco repertoire would have been redecoration by the same workshop, the aesthetic change was inevitable. The aesthetic change of appearance of an architectural interior through a redecoration could be sponsored by patrons to demonstrate their piousness, but through which they also asserted their political power. The communication of this message and act had to be conveyed visually to the visitors to the monuments, the faithful, and this could be achieved by the means of introducing new revetments, which could be quickly distinguished from the old ones based on their aesthetics. Perhaps the most illustrative example is presented by numerous decorative phases and lengthy historic inscriptions highlighting the significance of patronage of several decorative interventions at the congregational mosque and the shrine of the 'Abd al-Samad complex at Natanz (Cat. No. 12) and the Khanqah of Pir Husayn (Cat. No. 25).



The Farumad Friday mosque stuccos; Ilkhanid repairs and redecoration of earlier stuccos.

Figure 78: Chronology of decorative interventions at the Farumad Friday mosque.

Sanctification of Architectural Loci

General sanctification of architectural spaces is the act of redecorating a monument's interior on an extensive scale and without focusing on the monument's focal points. Such redecoration revetments sanctify the monument's interior through their presence in an architectural space, their visual appearance and religious inscriptions highlight the religious character of monuments in a general sense. One example is the last decorative phase of carved stuccos at the Farumad Friday mosque (Cat. No. 16). A targeted sanctification of an architectural space is the act of deliberately highlighting specific spaces or parts of monument interiors by means of application of architectural revetments which contain religious or historic inscriptions. In this manner, the newly produced revetments, visually appealing and with an inscribed message, highlight focal points of the monuments and they thus impact their function. Most frequently, such interventions comprised of the installation of a mihrab in an architectural space, which would come to constitute its focal point. The act of installation of the Uljaytu mihrab in the Isfahan Friday mosque (Cat. No. 1), for example, accentuated the significance of the mosque and its prayer hall for the faithful. Furthermore, redecoration of cenotaphs of revered personages in pilgrimage complexes, mausolea or *imamzadas*, highlighted the presence and the significance of the graves of Saints, Sufi Shaykhs or other revered personages in relation to the function of the monuments and performance of religious rites in their interiors. A larger scale targeted sanctification of a monument is also the act of continuously redecorating and accumulating architectural revetments with religious inscriptions in their most significant spaces, such as domed prayer halls (e.g. the Varamin Friday mosque, Cat. No. 28) or *qibla iwans* of mosques (for example, the last decorative intervention in the Farumad Friday mosque,

Cat. No. 16). In doing so, craftsmen could visually accentuate not only the direction of praying but also the main axes of the monuments.

Transformation of Function of Architectural Spaces

Fig. 79.

An installation of a limited number of revetments, with a specific function and meaning and on a specific focal point of the monument's interior, can impact or reflect the function of an architectural space or even the entire monument. Perhaps the most obviously discernible types of such interventions are the activities and sponsorship of mihrab installations.

Perhaps the most telling examples are the mausoleum of Pir-i Bakran (Cat. No. 2) and the 'Abd al-Samad complex at Natanz (Cat. No. 12). By 1303-04, during the second constructive and decorative intervention at Pir-i Bakran, a monumental mihrab was installed in order to close off the *iwan*'s opening. This installation of the mihrab signalled the transformation of the interior of the funerary *iwan* into a space designated for prayer activities. At Natanz, the original passages between the shrine of the Shaykh and the adjacent spaces were closed off around 1307-08 and 1310, for a lustre mihrab to be installed on the *qibla* wall in the proximity of the grave of the Shaykh, which was redecorated in lustre tile medium. In this manner, the funerary structure was transformed into a pilgrimage destination, where pilgrims were given space to perform their prayer rites next to the grave of the Shaykh. Similar phenomenon, but by means of installing a carved stucco mihrab, has been observed in the Abu al-Hasan al-Kharaqani mausoleum (Cat. No. 21), where the mausoleum was enlarged and a prayer space was created for the pilgrims.

At the Natanz complex (Cat. No. 12) another little-known transformation took place in the congregational mosque. The Buyid octagonal pavilion was originally a funerary structure, which was integrated into the congregational mosque during the Seljuq period. This was the first step of transformation of the funerary structure into the focal space of the congregational mosque of Natanz by Seljuq builders. The mosque was further rebuilt during the Ilkhanid period, when a monumental lustre tile mihrab was installed into the central section of the *qibla* wall of the octagonal pavilion. The installation of the mihrab highlighted the function of the older funerary structure and rendered it a focal point. Another related transformation of monument function is the phenomenon of monument repurposing, especially of funerary structures, which was often accompanied with redecoration campaigns. One such case is the Alinja Khanqah (Cat. No. 26), where the extant tomb tower with exterior revetments was repurposed into the burial structure of the Shaykh Na'imi.

Changes of Epigraphic Programmes and their Impact on Function and Meaning of Monuments

Application of a new revetment repertoire by means of a redecoration intervention determined changes of the original epigraphic repertoires of monuments. Comparison of original and redecorated revetment repertoire inscriptions' content thus allows possible changes in the meaning of repertoires to be discerned, which affect function and meaning of the monuments. These changes can be roughly divided into two groups, drawing on the type of content of inscriptions, between historic inscriptions and religious inscriptions (Hadiths, Qur'anic excerpts, invocations).

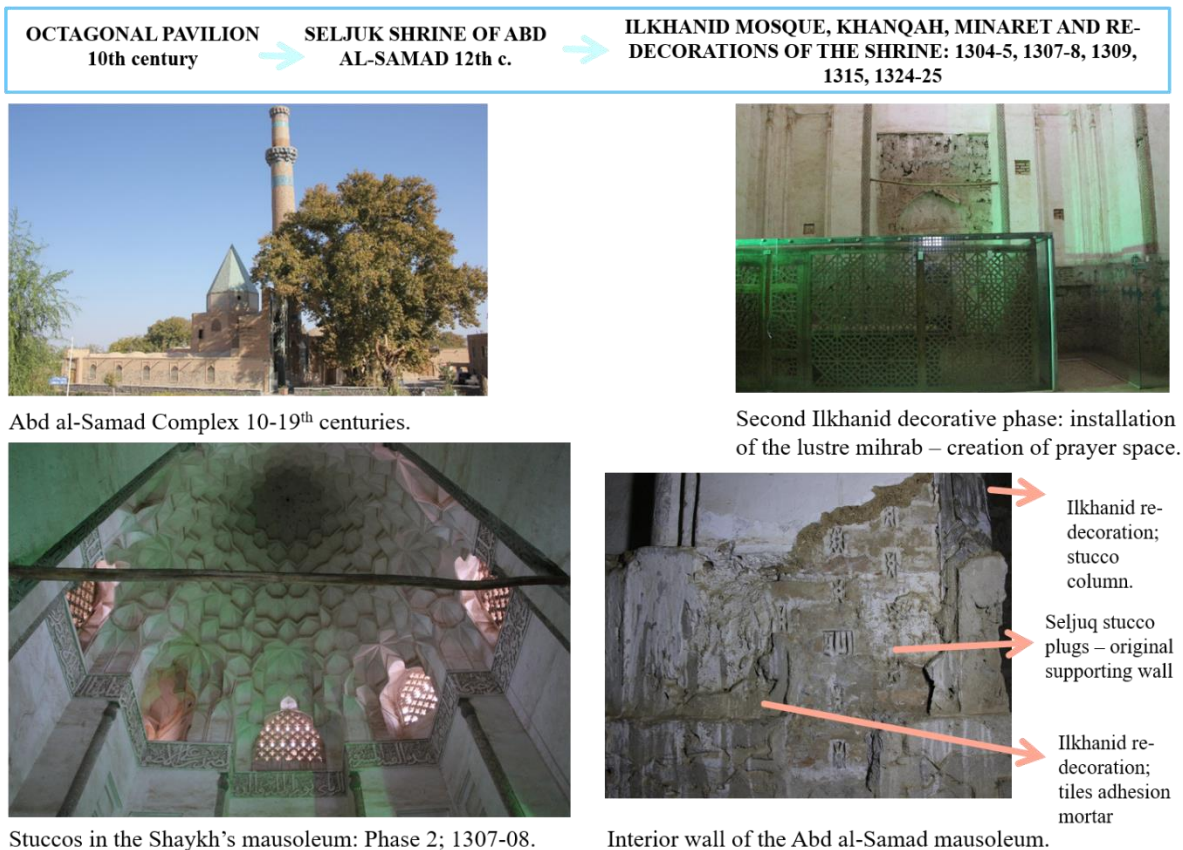


Figure 79: Decorative phases at the shrine of Shaykh 'Abd al-Samad in Natanz.

Historic Inscriptions

Fig. 80.

Production of revetments with historic inscriptions in redecoration campaigns could have two types of impact on monuments. The first impact concerns the repurposing of a monument or a rediscovery of its religious significance, most frequently a funerary structure. In such cases, redecoration revetments contain inscriptions informing about the function of the building or the identity of the revered person buried in the structure. Some examples are the historic inscriptions of the Pir-i Bakran mausoleum (Cat. No. 2), the 'Abd al-Samad complex at Natanz (cat. No. 12) and the Bayazid Bistami complex (Cat. No. 19). At Pir-i Bakran, the historic inscription of the third decorative repertoire copies the content of the first and the second repertoires, to highlight the function of the monument as a funerary structure of the Sufi Shaykh. The earliest historic inscriptions in the mausoleum, dated 1303-04 (especially the inscription in the burial chamber), recount the information concerning the identity of the Sufi Shaykh and the time of his death. They highlight the identity and function of the funerary structure which however pre-dates the passing away of the Shaykh and could have originally had a different function. At Natanz, the monumental carved inscription (dated 1307-08) running along the top edges of supporting walls of the shrine of the Shaykh provides information regarding the identity of the Shaykh and the sponsor of the shrine. This research had shown that the shrine pre-dates the death of the Shaykh and in light of this evidence, the inscription's significance changes. The inscription highlights the new function of the monument (which was repurposed for the burial of the Shaykh) and the patron of the undertaking, who was a state official. At the Bayazid Bistami complex, the historic inscription, running along the central lunette of the

monumental carved stucco mihrab in the mosque of the complex, highlights the function of the complex and the identity of the Shaykh, which signals the significance of the redecoration patronage and the rebuilding of the earlier pilgrimage complex as a sort of rediscovery of its significance.

In the second case, historic inscriptions report information concerning patronage of a redecoration which may signal that the religious monument is indirectly affiliated to the state under which the redecoration intervention was sanctioned by a patron who is a state employee. Some examples are the historic inscriptions of the Pir Husayn Khanqah (Cat. No. 25), the Marand Friday mosque (Cat. No. 22) and the Uljaytu mihrab (Cat. No. 1). The rich epigraphic programme of the Pir Husayn Khanqah, stemming from several decorative phases, highlights the importance of patronage and the identity of patrons of redecoration interventions. These inscriptions illustrate that the patronage of the complex, over more than a century and a half, was state-sanctioned.



Figure 80: Copying of historic inscriptions at the Pir-i Bakran mausoleum.

Religious Inscriptions

Figs. 81-82.

Redecoration intervention revetments were occasionally integrated into existing repertoires and sometimes they were juxtaposed with existing decorative programmes through their visual characteristics and epigraphic content. In several cases, redecoration programmes feature only Qur'anic excerpts, and they do not differ substantially from pre-existing epigraphic programmes. This is, for example, the case of the Pir Husayn Khanqah (Cat. No. 25), where the carved stucco mihrab and lustre tile frieze retain diverse Qur'anic excerpts, but where their clearly visible or lengthy historic inscriptions (highlighting the importance of patronage, the

identity of patrons and the rulers during whose reign the interventions took place) are more significant. In some other cases, it is difficult to discern whether there is a difference between epigraphic programmes of decorative interventions, due to the fact that earlier revetments are concealed by those of redecoration campaigns.

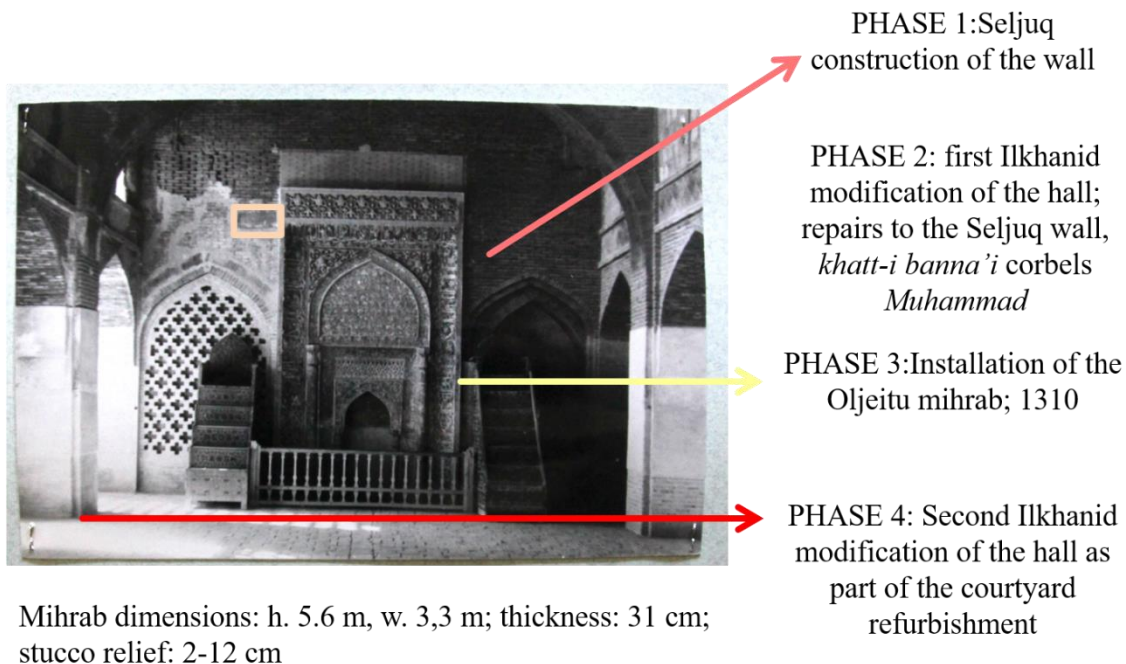


Figure 81: The change of the content of religious inscriptions through three decorative phases at the Pir-i Bakran mausoleum in Linjan (Cat. No. 2).

The change of message and meaning of an epigraphic programme, which determined change of function and meaning of monuments, is best discernible through the Shi'ite inscriptions, which were frequently parts of epigraphic programmes of redecorations. Some examples comprise the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), the Friday mosque of Isfahan (Cat. No. 1), the Pir-i Bakran mausoleum (Cat. No. 2), the Ushturjan Friday mosque (Cat. No. 4) and the 'Abd al-Samad complex in Natanz (Cat. No. 12). The Uljaytu mausoleum at Sultaniyya was decorated in two phases, in a short time span. The reasons for the second decorative intervention have been long debated by scholars, and recently, in a revisited discussion, Blair confirms the hypothesis that the most plausible reason was the conversion of Sultan Uljaytu to the Shi'ite faith.⁹³³ The aim of the redecoration campaign at Sultaniyya was therefore that of providing a new epigraphic programme for the mausoleum's interior. This programme highlights the Shi'ite doctrines, and it thus transformed the mausoleum of the Sultan from a Sunnite into a Shi'ite funerary complex, which was intended to also function as a pilgrimage destination. The described change reflects the socio-political developments in the Ilkhanid Empire.

⁹³³ Blair 2014, 112-135.

The Uljaytu hall – Phases (based on Eugenio Galdieri)



(Information from: N. Isfahani *et al.*, 2010)

Photo stored at the ISMEO archive in Rome (currently located in the M.N.A.O. storage). Consulted in August 2016. Negative no. L 4389/2, by Faccenna in 1964.

Figure 82: Constructive and decorative phases related to the installation of the Uljaytu mihrab in the Isfahan Friday mosque (Cat. No. 1).

This research shows that the 1310 Uljaytu mihrab installation at the Isfahan Friday mosque (Cat. No. 1) also needs to be comprehended as an Ilkhanid redecoration intervention. Its inscriptions propose two important messages: that of patronage and that of religion. The mihrab comprises a specifically planned and designed epigraphic programme consisting of Shi'ite Hadiths and the Shi'i Shahada; its inscriptions are the first Shi'ite oriented inscriptions within the monument and they communicate the change of the official creed within the Empire, at one of the most significant public spaces. At the Pir-i Bakran mausoleum, the Square Kufic inscription panels of the third decorative stage (1312-1313) with Shi'ite content (e. g. Blessings to Muhammad and the Fourteen Infallibles) need to be comprehended in juxtaposition with the first decorative stage (end of 13th century) featuring the Sunni Shahada and the names of the four Orthodox Caliphs. This juxtaposition reflects the patron's will to change the mausoleum's epigraphic programme, as a sort of update, and for it to reflect the trend of the change (to the Shi'ite faith) of Uljaytu's religion in 1309. These Square Kufic panels feature distinct visual characteristics, compared to two earlier decorative stages of the mausoleum. This makes them stand out within the mausoleum's rich decorative repertoire.

c.) Reasons for Redecoration Campaigns

Fig. 83.

The research allows three main reasons or motivations for redecoration of Ilkhanid monuments to be pinpointed, which could go hand in hand with each other: the need for repairs, the need for enlargement and the need for patronage.

Repairs

Perhaps the most obvious factor is the Mongol conquest of the territory which may have, in some cases, caused destruction of buildings. Consequently, repairs of these structures took place in the first decades of the Ilkhanid reign, until approximately the end of the thirteenth century. Some, but not many cases of such interventions can be proposed. Perhaps the most illustrative examples are the Friday mosque of Gar (Cat. No. 7) and perhaps the Friday mosque of Sava (Cat. No. 34). The Friday mosque of Gar is the earliest dated Ilkhanid monument with carved stuccos. Its historic inscriptions indicate that the earlier Seljuq mosque was rebuilt and redecorated with carved stuccos and *Khatt-i banna'i* by 1260-61. It is likely that the earlier mosque structure could have been damaged, or deteriorated, which prompted these constructive and decorative interventions. Another plausible case is the Sava Friday mosque, for which written sources state that it was damaged by the Mongol conquest and subsequently rebuilt. The discussion of the monument and the observations of locations of its Seljuq mihrabs illustrate that the mosque was not entirely destroyed by the conquest, but that it might have been partially rebuilt in Ilkhanid times. The Ilkhanid mihrab of the mosque however seems to be of an early fourteenth century vintage. Lack of further tangible examples indicating the Ilkhanid rebuilding of monuments, presumably destroyed during the Mongol conquest of the Iranian territory, might indicate that monuments may have been spared destruction, or more likely, that the destruction was of a much lesser scale, compared to what is stated in written sources and by modern scholars.

Some Ilkhanid redecorations of earlier monuments could have accompanied building repairs to the damage caused by earthquakes. These could be the carved stucco mihrabs of the Kashan and Tabriz (Cat. No. 24) Friday mosques. At the Tabriz Friday mosque the Ilkhanid monumental carved stucco mihrab could have been a rebuilding and redecoration work to repair the damage of the 1273 or the 1304 earthquake.⁹³⁴ The analysis of the mihrab indicates that it likely dates from either the late thirteenth or early fourteenth century, which matches the chronological context in which earthquakes occurred. Further investigations and archaeological excavations would be necessary in order to establish more firmly the connection between earthquakes and Ilkhanid repair and redecoration interventions.

Another cause for the need of monument repairs is their deterioration through the passing of time. Importantly, monuments could be more susceptible to deterioration, if they were incorrectly constructed or if they were built with material less resistant to atmospheric agents. One case of a monument which was likely rebuilt and redecorated due to its deterioration has been pinpointed during the research: the Haftshuya Friday mosque (Cat. No. 3). In addition, it is important to note that many Ilkhanid monuments are no longer extant, due to their deterioration and because they were built out of less resistant material.

Enlargements

Enlargements of Ilkhanid monuments, which could comprise transformation of their function, could be performed for several reasons, such as growth of population, sponsorship and fostering of pilgrimage, and forging of political alliances through pious patronage. Some examples of mosque enlargements, due to population growth, which occurred in the Ilkhanid period, could be: the Bistam Friday mosque (Cat. No. 18) and the Haftshuya Friday mosque (Cat. No. 3). In both cases, earlier mosques were rebuilt and they increased in size. *Ex novo* construction of

⁹³⁴ Melville 1981, 161-162.

secondary mosques located in newly established living quarters, or those which were enlarged, also signalled growth of population during the Ilkhanid period.

Sponsorship of pilgrimage is reflected in enlargements of monuments, best described by Lisa Golombek as the phenomenon of the *Little cities of God*.⁹³⁵ Pilgrimage complexes developed over longer time spans, by means of additions of structures and numerous redecoration interventions. Islamic builders and craftsmen often transformed a modest mausoleum, such as the Baba Afzal mausoleum in Maraq (Cat. No. 14) into a large pilgrimage complex. Further examples, as already noted by Golombek, include the Pir-i Bakran mausoleum (Cat. No. 2), the 'Abd al-Samad complex at Natanz (Cat. No. 12), the Bayazid Bistami complex in Bistam (Cat. No. 19), the Pir Husayn Khanqah (Cat. No. 25) and the Turbat-i Shaykh-i Jam complex (Cat. No. 30). These monuments developed around tombs of revered personages or other sources of sacredness, such as the historic loci.⁹³⁶ In this respect, the architectural structure and its revetment programme highlighted the significance and the meaning of the source of sacredness, but also the significance of patrons who demonstrated their piety by providing financial support for the up-keep of the monuments. Through the passing of time, small funerary structures evolved into multi-functional pilgrimage complexes with infrastructure to cater for religious practices of local populations and pilgrims.

Another reason for an enlargement of a monument could also be the will of patrons to forge political alliances by sponsoring pious endowments. This has been best described by Potter,⁹³⁷ in the case of the Turbat-i Shaykh-i Jam complex. As Potter explains, the political power of the Jami Shaykhs attracted patrons for parts of the complex, who intended to form a political alliance with the Shaykhs. Consequently, the Shaykhs succeeded in forming an extensive pilgrimage complex and to accumulate an extensive endowment and properties for the family and the shrine.

Conclusion

The discussion of redecoration interventions, their functions and reasons for them, illustrates the logic behind the production of Ilkhanid architectural revetment repertoires. As shown, this is not unique to the Ilkhanid period, but observations of these procedures are necessary to better understand the craftsmen's logic and reasoning behind the production of Ilkhanid carved stuccos and in order to be able to discuss function and meaning of Ilkhanid stuccos; they can only be understood when contextualized by understanding the reasons for production of carved stuccos and their relation to monuments.

⁹³⁵ Golombek 1974. See also Golombek 1971.

⁹³⁶ For example, the rock with the footprint of 'Ali's horse on the spot from where he ascended to heaven, at the Pir-i Bakran mausoleum.

⁹³⁷ Potter 1994.

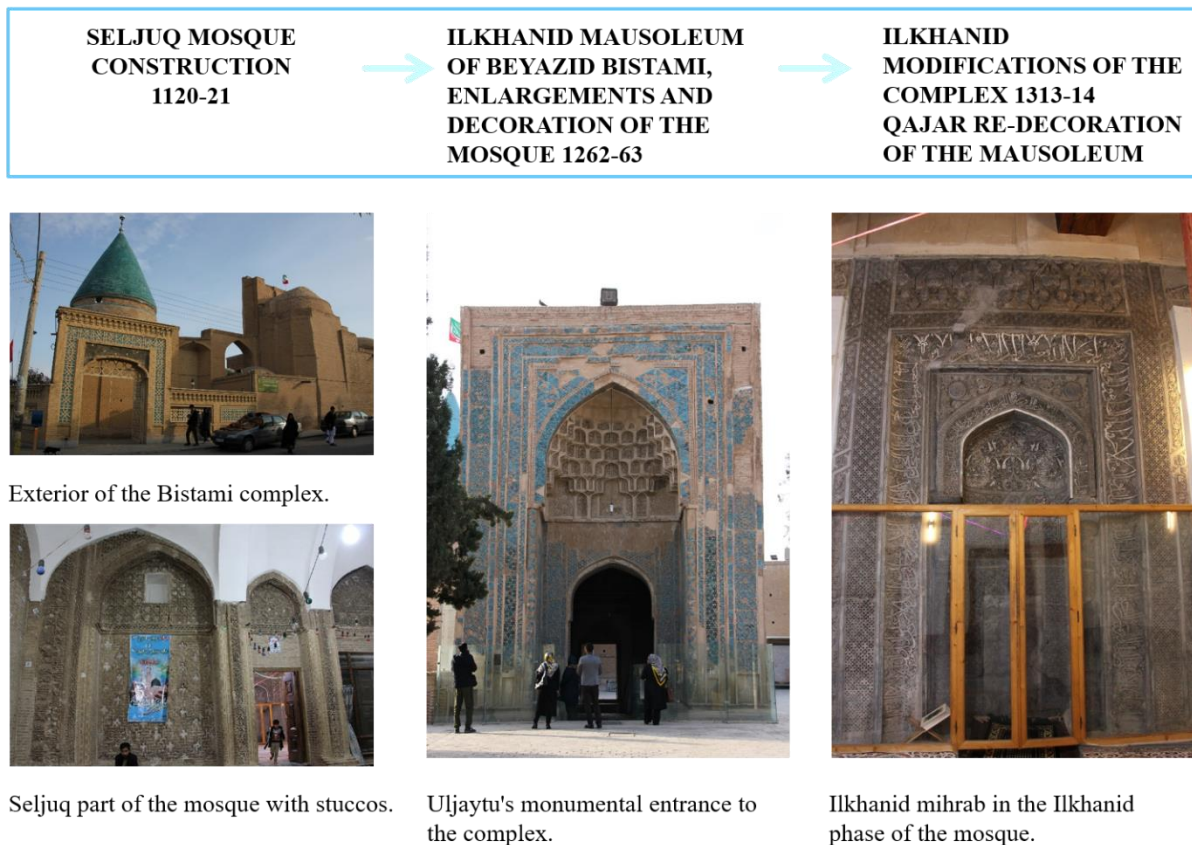


Figure 83: The Bayazid Bistami complex and its multiple constructive and decorative phases (Cat. No. 19).

5.3 Towards An Understanding of Craftsmen's Artistic Notion through the Analyses of the Making of Stuccos

a.) *Pentimento* – the Craftsmen's Change of Mind

The Craftsmen's Change of Mind in Carved Stucco Working – Understanding of the Phenomenon

The phenomenon denoted as *pentimento* in Italian⁹³⁸ is a term employed to describe artistic practice first spotted in the Italian Renaissance art.⁹³⁹ It has two connotations: its literal meaning⁹⁴⁰ can be translated as regret, repentance, remorse and its figural meaning⁹⁴¹ can be translated as a change of mind, a second thought or a reconsideration. The described art phenomenon has no English equivalent; the closest translation would correspond to *reconsideration* or *change of artist's mind*. The term denotes the artist's reconsideration of the original design of architectural revetments and the consequent modification to its original

⁹³⁸ *Pentimento*, from verb *pentirsi* – to regret, change one's mind, have second thoughts. See Weyer *et al* 2016[2015], 90-91.

⁹³⁹ Art historians employ the expression to describe evidence regarding the artist's change of original design or modifications of original design for an art work, most commonly an altar piece painting on wooden support or frescos. One of the best examples of *pentimento* in European Medieval revetments can be observed on the *Transfiguration* by Gerolamo Savoldo, dated 1533 (Florence, Galleria degli Uffizi).

<https://www.virtualuffizi.com/giovanni-girolamo-savoldo.html> (Last Accessed: December 16, 2021).

⁹⁴⁰ Synonym of *rimorso*.

⁹⁴¹ Synonym of *ripensamento*.

design, which this research discerned on Ilkhanid stuccos. It can be divided into two groups. The first type comprises design changes which are natural to the design making process and therefore denote natural refinement of the design, which can be classified as *pseudo-pentimento*. The other type, the *true pentimento*, comprises unforeseen modifications of revetment designs. These design modifications can range from partial to complete modifications of stuccos. The same phenomenon can be employed to describe enlargements, additions to, or reducing of the size of the original project for the artistic repertoire.⁹⁴² Modifications of Ilkhanid stucco revetment repertoire designs were most commonly caused by problems which occurred during production of stucco revetment repertoires and the craftsmen's change of heart therefore reflects craftsmen's solution to these issues via modifications of original plans for stucco revetment repertoires.

The Pseudo-Pentimento in Ilkhanid Stucco Design

Fig. 84.

The Pseudo-pentimento or pseudo-change of artist's mind is the natural process of refining of the stucco design for carving. It can be observed on the Uljaytu mihrab (1310) at the Friday mosque of Isfahan (Cat. No. 1). The *Thuluth* inscription of mihrab's central, interior inscription framing band, reveals traces of outlines for the inscription. These design traces were produced with red colour which was the first design of the inscription. The red outline was subsequently traced over with black, which came to constitute the final inscription outline for the carving. The design was therefore refined via the tracing of the black outline.⁹⁴³ This phenomenon has little parallel examples.⁹⁴⁴ Monumental inscriptions of the Uljaytu mihrab therefore went through two stages of stucco design refinement from the moment when the original stucco design was transferred onto the stucco surfaces until the final stucco relief was carved. The final output was therefore different, or more refined in comparison to the original sketch for the stucco mihrab. These refinements served to correct the imprecisions, which occurred during the stucco design transfer.⁹⁴⁵ This was a natural procedure in stucco revetment production.

Other stucco repertoires, such as the Pir-i Bakran (Cat. No. 2) mihrab and the burial chamber lunette (Panel U) in the mausoleum retain similar red outlines. Further related outlines have been documented in repertoires such as the Abarquh Friday mosque mihrab (Cat. No. 10) and the Haftshuya Friday mosque mihrab (Cat. No. 3), but no refining of design was spotted.⁹⁴⁶ The same phenomenon of design refinement is observed on terracotta revetments from the Ilkhanid period where the design was produced by direct incisions. Stucco repertoires such as the Farumad Friday mosque (Cat. No. 16) and the Bistam Friday mosque (Cat. No. 18), reveal

⁹⁴² Such type of pentimento was not observed in European Medieval architectural repertoires, likely because the planning for the repertoires was more detailed and more precise, in comparison to Ilkhanid stucco revetment production.

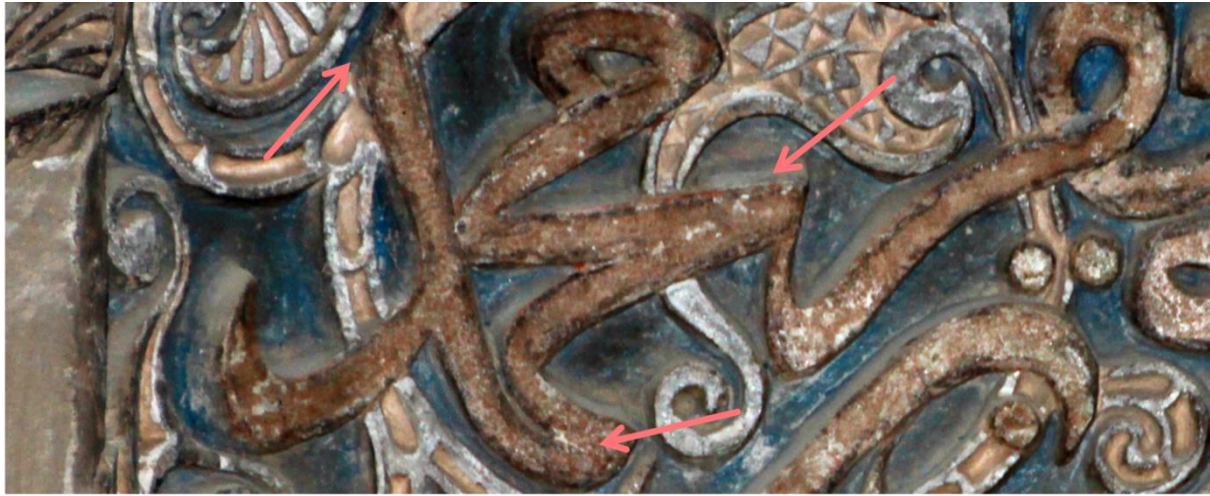
⁹⁴³ It is observed that the stucco carver in some spots did not follow the colour outlines for the inscriptions, which means that he also refined the (already refined) painted outlines design for the stucco revetment.

⁹⁴⁴ It can only be spotted on stuccos where the original paint was lost, but the traces of design remain preserved.

⁹⁴⁵ These corrections could have been performed based on craftsmen's observations of original stucco design sketches.

⁹⁴⁶ Two hypotheses can be put forward in this respect. Red colour is more resistant than the black one, which might cause loss of the second refined design of stuccos. The black outline was well preserved in the case of the Uljaytu mihrab, because it is well protected from direct sunlight and weathering, moreover its paint and gilding, which cover the design traces, is still in good form and it allowed for the preservation of the two outlines. On the other hand, it is possible that double outline system with refinement of stucco design was only used for the most important stucco revetments, such as the monumental inscriptions of the Uljaytu mihrab.

direct incisions on stucco surfaces, which served for stucco design carving. Where incisions are still visible, they are visible because carving was not performed according to the original stucco design. Rather, the stucco carver followed the design incisions where he considered it appropriate and on other spots, the carver refined the stucco design during the carving process.



The Uljaytu mihrab. Red inscription outline is covered by the black final outline for the carving procedure.

Figure 84: Refinement of stucco inscription design at the Uljaytu mihrab in the Isfahan Friday mosque (Cat. No. 1).

The True Pentimento in Ilkhanid Stucco Design

Fig. 85.

The craftsmen's change of mind concerning the final stucco revetment design, upon its application on the stucco surface and prior to its carving, is a form of a true pentimento or the true change of an artist's mind. The evidence from the Pir-i Bakran mausoleum (Cat. No. 2), the carved stucco panel with the historic inscription dated 1303-04 and the mihrab from the same decorative phase, provide information regarding this phenomenon. Traces of original stucco design for the mihrab stucco carving are visible on parts of the mihrab, where it lost its original polychromy layer.⁹⁴⁷ Lower parts of the mihrab, especially the pointed inner arch, formed by a twisted torus moulding and covered with slightly protruding tripartite leaf-like elements, contain traces of its original design. This original design, which was applied on the stucco surface before carving, was applied with brushes in a red colour with hues of orange to dark red still visible on the surface of the carved stucco. These design traces consist of shadows of trefoil leaves, which are similar in form to floral ornaments of carved stucco, but they do not correspond to the carved design. This evidence suggests that the craftsmen who had to carve the mihrab changed the original design of this panel.⁹⁴⁸ This evidence illustrates that numerous modifications to original stucco revetment design were performed during the stucco production process and that they strongly impacted final visual characteristics of stuccos. This practice was likely more common, or even part of the stucco production process, than what is acknowledged.

⁹⁴⁷ They are especially clear on the round column shaft-like floral band which frames the niche of the mihrab.

⁹⁴⁸ It is not evident whether the same craftsmen applied the design with red colour and subsequently proceeded with carving the stucco layer.



Figure 85: Change of the original stucco design during the stucco production process: evidence from the mihrab of the Pir-i Bakran mausoleum (by 1303-04).

b.) Craftsmen's Homage to their Predecessors

Craftsmen's Homage

The phenomenon of *omaggio*⁹⁴⁹ can be translated into English as *homage*. This term is frequently employed in studies of European art to denote the artist's act of paying homage to his predecessors, often renowned.⁹⁵⁰ This phenomenon is most commonly manifested by artists including references to earlier masterpieces of art into works of their own; in form of small recognizable images, by copying famous art works, or by alluding to them by reinterpreting themes of renowned works. For Ilkhanid stucco revetments, the term homage can be employed to denote acts by stucco craftsmen referencing earlier anonymous stucco craftsmen or to their own stucco workshops. The homage to predecessors is frequently observed in interventions of redecoration where craftsmen integrated earlier architectural revetments into new decorative repertoires. The homage to one's stucco workshop is reflected in signatures of master stucco craftsmen who led these workshops.

⁹⁴⁹ Synonym of *atto di reverenza*; can also mean gift, present, or something free of charge.

⁹⁵⁰ One of the most renowned examples of artist's homage to their predecessors is the work of Jean Auguste Dominique Ingres, *Raphael and La Fornarina* (Raphaël et la Fornarina), 1811-1812/1814, Oil painting, 66 × 54 cm, Fogg Art Museum, Inv. No. 1943.252, Harvard University Art Museum in Cambridge, Massachusetts, USA. <https://harvardartmuseums.org/collections/object/299807> (Last Accessed: December 16, 2021).

Homage to Oneself – The Auto-Homage

The homage to oneself in Ilkhanid stucco production regards the stucco craftsmen's act of honouring the stucco workshop in which they work.⁹⁵¹ This willingness to claim a stucco revetment masterpiece authorship, or the credit for its making, is expressed in craftsmen's signatures on stuccos (see Chapter 4, Section 4.2). On Ilkhanid revetments, we find craftsmen's signatures on lustre tiles and wares, woodworks (e.g. the Na'in Friday mosque minbar), wall paintings (e. g. the Farasha Qadamqah), stone carvings (e. g. the tombstones of the Shaykh Yusuf Sarvistani complex) in manuscripts and other media. A separate section of this dissertation is dedicated to signatures on Ilkhanid carved stuccos (see Chapter 4; Section 4.2). These signatures in carved stucco medium, denote the signatory artists, who were stucco masters and heads of stucco craftsmen's workshops. These signatures were mainly placed in the areas located in sections of stucco revetments close to visitors, rather than revetments placed on higher locations in monumental architectural interiors. This suggests that the choice of location for signatures was deliberately made in order to render the signatures visible and legible to the faithful. Unlike longer inscriptions, these signatures frequently contain diacritical marks and occasional vocalization, to be easily read by the literate audience.

Homage to Predecessors

Figs. 86-87.

The phenomenon of appreciation of stucco craftsmen's work, by their successors, has been observed in monuments, which were re-decorated in one or more phases. The payment of respect to earlier stucco and tile craftsmen by redecorators of architectural interiors can be discerned from observations of two distinct practices, which stem from the nature of redecoration campaigns: the indirect homage to predecessors and the direct homage to predecessors.

The indirect homage to predecessors could be enacted by craftsmen who redecorated an existing carved stucco repertoire. These interventions almost inevitably caused an overlap or covering up of earlier architectural revetments. Sometimes, such as in the case of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), craftsmen were ordered to deliberately cover up earlier architectural revetment repertoires. In other cases, craftsmen might have been ordered to produce new architectural revetments and they could have been given a higher degree of freedom in performing redecoration campaigns. In such cases, craftsmen, before producing a new revetment repertoire, observed the characteristics of the existing stuccos and decided which parts of the repertoire should be covered with new revetments and if any parts of older repertoire should be kept in place and integrated in the new decorative programme. The decision to keep a certain part of architectural repertoire and to integrate it into a redecoration campaign, reflects craftsmen's appreciation of works produced by their predecessors. This type of appreciation is therefore indirect or subconscious, where the craftsmen chose which parts of architectural revetment should stay in place and which ones were integrated in the new architectural revetment repertoire. Perhaps the best example is found at the Pir-i Bakran mausoleum (Cat. No. 2) where certain parts of earlier architectural revetments, such as the lustre tiles, were left on purpose in their location and integrated in two subsequent repertoires. For example, the tiles

⁹⁵¹ In European art, the homage to oneself could be performed by artists portraying themselves in their works. One example is the auto-portrait of Raphael (Raffaello Sanzio) in his work, *School of Athens* (Scuola di Atene), 1509–1511, Fresco, 500 cm × 770 cm, Apostolic Palace, Vatican City. Bora *et al* 2002, Vol. 3, 337-342.

with animate imagery and religious content must have been left in place because of their value and meaning.⁹⁵²

The second type of homage also manifests itself through the process of redecoration campaigns. After having selected architectural revetments which should be integrated into the new revetment repertoire and after having decided which earlier revetments need to be covered up, the stucco craftsmen planned their stucco revetment repertoire design. A specific case of partial covering and deliberate indication of presence and existence of earlier revetments is found in a few Ilkhanid monuments and it can be understood as craftsmen's willing indication of appreciation of the works of their predecessors. In these examples, stucco craftsmen who redecorated interiors and had to cover up stuccos decided to cover some of them with perforated stucco grills. Perforations in these grills indicated the presence of earlier stucco layers beneath them by means of their partial visibility and indication of their presence. Such redecoration transformation through stucco grill production therefore symbolically indicated presence of earlier stuccos. By doing so, the older stucco revetments, evidently appreciated by redecorators acquired a significance close to a *reliquia* of old stucco masters to which homage was paid.

One of the examples is found at the Pir-i Bakran mausoleum (Cat. No. 2). Here, two perforated lunette grills from the third decorative stage were installed to indicate the presence of carved stucco layers beneath them, which were produced in the second decorative stage; they remain only in fragments.⁹⁵³ Similar practices can be hypothesized for the Uljaytu mihrab (Cat. No. 1), where the historical photos illustrate the presence of an elaborate floral decoration panel in its top register; the same photos indicate that this panel with lotus-derived motifs used to be covered up with a stucco grill consisting of palmette-like elements and openings, which indicated the presence of the lower stucco panel.⁹⁵⁴ A Related practice can be also be hypothesized for the Urumiya Friday mosque mihrab, which bears an inscription with a craftsman's signature dated to 1277. It is however likely that the central part of the mihrab is a result of post-Ilkhanid (Qajar?) redecorations.⁹⁵⁵ The example found at Urumiya is similar; the older mihrab is covered with a layer of more recent stuccos and the presence of earlier stuccos is indicated through perforations in the grills of the mihrab's monumental lunette.

Another less frequently documented type of direct homage to earlier craftsmen is found in the Farumad Friday mosque (Cat. No. 16). In the mosque, decorated in both the Seljuq and Ilkhanid periods, a specific case of stucco copying is found. It seems that Ilkhanid craftsmen, when restoring the mosque's revetment repertoire and covering up damaged parts of stucco revetments dating to the Seljuq period, copied Seljuq revetments in their style.⁹⁵⁶ This is shown on the connective opening between the *qibla iwan* and its south-eastern prayer spaces, where the Qur'anic excerpt of the first decorative phase of the mosque was covered with a later stucco

⁹⁵² Tile re-use in different architectural context also reflects craftsmen's appreciation of extant artistic works of their predecessors.

⁹⁵³ The panels to be covered with grills were chosen selectively, because on some other parts of the revetments, the same interventions resulted in entirely covering up earlier stucco revetment layers.

⁹⁵⁴ This upper panel was damaged, or perhaps removed on purpose to show the earlier panel. The same might have happened also at Pir-i Bakran. Later restoration interventions of the Uljaytu mihrab however reconstructed the upper panel and again concealed the stucco panel beneath it.

⁹⁵⁵ Amir Hossein Karimy, paper presented at the, *I Love Persian Stucco Conference*, University of Bamberg, April 2018. The perforated grill forming the lunette of the Urumiya mihrab seems to contain elements of iconography (small floral elements positioned on intersection of underlying geometric grid) alien to Ilkhanid floral ornamental stucco iconography, which points towards a possibility for its later dating.

⁹⁵⁶ Kaveh Mansouri, paper presented at the *Seljuq and Ilkhanid Stucco Revetment Conference*, University of Kashan, April 2017.

layer into which a similar Qur'anic excerpt was carved. In doing so, the craftsmen observed the extant decorative programme and copied its inscription style and thus paid homage to their predecessors.



The Pir-i Bakran mausoleum: perforated stucco grills (only fragments remain) from the third decorative phase 1312-3, were made to cover earlier stucco revetments from the second decorative phase (1302-3).



The Urumiya Friday mosque mihrab: upper parts of the perforated mihrab lunette cover and earlier mihrab.

Figure 86: Examples of direct homage to predecessors: perforated stucco grills cover earlier stuccos and render them a type of a reliquia.

Another type of direct homage to earlier craftsmen is presented by the historic inscription on the right-hand side panel of the interior niche of the Nayriz Friday mosque's monumental stucco mihrab.⁹⁵⁷ In this case, the craftsmen of one of the last decorative interventions on the mihrab rendered the history and the memory of the earlier mosque's mihrabs explicit, by producing a pseudo-historic inscription. The carved historic inscription panel claims that the first mihrab dated to the year 973-74, the second one to 1076-77 and the third mihrab to 1164-65 and that the fourth mihrab was produced at the end of the fifteenth century.⁹⁵⁸ The inscription is of pseudo-historic nature, due to the unlikeliness of the rhyming dates of the mihrabs being their actual dates. The unique inscription highlights the importance of the memory of earlier mihrabs in the mosque, as a type of a sacred *reliquia* and consequently also as a mode of appreciation of works of earlier craftsmen.

⁹⁵⁷ Qasimi 2004, Vol. 8, 56-61; <https://archnet.org/sites/3859> (Last Accessed: June 7, 2021).

⁹⁵⁸ TEI 34323 (Consulted on: June 7, 2021). See also Godard 1936, 171.

Mihrab renovation inscription at the
Friday mosque of Nayriz, Nayriz, South
Iran

(١) تأريخ محراب أول في سنة ثلاث

(٢) ستين و ثلثمائة و دوم في سنة

(٣) ستين و أربع مائة و سوم في سنة

(٤) ستين و خمس مائة مع السقف و چهارم

(٥) أمر الولي عماد الملك و الدو

(٦) لة (الدولة) و ... عز نصره في جمادى الثانية

The first mihrab dates to the year 363 AH (973-74 CE) and the second mihrab (dates to) the year 460 AH (1076-77) and the third mihrab with the ceiling (iwan, dates to) the year 560 AH (1164-65) and the fourth mihrab was built (by) the Wali Imad al-Mulk wa al-Dawla wa (sic) the Almighty Victorious in the Second Jumada (of 1494-95).

After Thesaurus d'Epigraphie Islamique.
<http://www.epigraphie-islamique.org/epi/consultation.php#results-index>
(Accessed: March 25, 2019)



Figure 87: The pseudo-historic inscription of the Nayriz Friday mosque mihrab.

c.) Craftsmen's Perception of Content of Epigraphic Programmes

Historic Inscriptions' Perception (and Copying)

Fig. 80.

Studies of historic inscriptions on monument revetments revealed that in some cases, craftsmen copied inscriptions from earlier repertoires for inscriptions of redecoration interventions. The evidence for this phenomenon are the minute grammatical mistakes, which the craftsmen copied along with the inscription content. The most significant example is provided by historic inscriptions at the Pir-i Bakran mausoleum (Cat. No. 2) which were produced in three separate interventions. The repeating of their content and of their grammatical shortcomings, allow the process behind the copying of historic inscriptions to be reconstructed, which can be described as text editing. The longest and the earliest historic inscription in carved stone medium (dated 1303-04) is written without any grammatical mistakes and it is located on the cenotaph of the Shaykh Bakran. The master text of this inscription was copied by stucco craftsmen in charge of the second decorative stage dated 1303-04. They employed the text on the cenotaph and copied its content for the historic inscription in the burial chamber (which repeats the information concerning the titles of the Shaykh, the function of the monument and the time of the passing away of the Shaykh). In the process of copying of the inscription the craftsmen miss-read the genitive construction (*of the Shaykh of the Shaykhs*) and wrote it erroneously. This mistake repeats in the shortened inscription of the same date, in carved stucco, placed above the original entrance of the mausoleum. The monument was subsequently redecorated in stucco medium in the third decorative stage dated to 1312-13, which comprises one historic inscription. For this historic inscription, craftsmen edited the text from the earlier burial chamber carved stucco inscription dated to 1303-04. They shortened the inscription and changed a few expressions and the date of its completion. In the process of inscription text editing, they also copied the

grammatical mistake of the genitive construction (*of the Shaykh of the Shaykhs*), which confirms that the source of the inscription content is the panel from the tomb chamber (and not the cenotaph). Locations of inscriptions at the Pir-i Bakran mausoleum (in different architectural spaces – the burial chamber, the entrance portal and the monumental *iwan*) demonstrate that the text editing process likely occurred by the means of notes and sketches of inscriptions or through their oral narration, which is however less likely. Craftsmen either needed to possess knowledge of Arabic or they must have been aided by an external expert.



Figure 88: Completion of the Qur'anic excerpt despite lack of space for the inscription, at the Pir-i Bakran mausoleum, third decorative phase (1312-13).

Religious Inscriptions' Perception

Fig. 88.

Craftsmen's perception of religious inscriptions in carved stucco revetment programmes can be pinpointed by observations of the way in which craftsmen produced them. For the production of stucco inscriptions in Kufic styles (angular scripts), craftsmen copied inscription designs from small size sketches onto stucco surface with the aid of incised grids and baselines. The difference in design scale between the small sketch and the stucco surface, and the mentioned mode of design transfer frequently caused the craftsmen to run out of space necessary to reproduce the entire inscription text. This is particularly the case with inscriptions comprising Qur'anic excerpts which are arranged in verses. When craftsmen ran out of space for inscriptions, this resulted in incomplete (unfinished) Qur'anic verses. This was not desired because the act of the breaking of the verse, or not writing an entire verse, was likely considered and offence to the religion, or even a blasphemy. Craftsmen could accordingly either leave the Qur'anic verses unfinished, or they could complete them in a separate space close to the end of inscriptions. Both types of solutions have been documented in Ilkhanid carved stuccos.

A good example is provided by the inscriptions of the Pir-i Bakran mausoleum (Cat. No. 2), the *shah nishin* ceiling of the Isfahan Friday mosque's northern *iwan* (Cat. No. 1) and the mihrab of the Imamzada 'Abdullah at Gudzar (Seljuq or Ilkhanid?). At Pir-i Bakran, the carved stucco panel in the burial chamber of the mausoleum, dated 1303-04, contains the Opening chapter of

Qur'an in the background of the historic inscription. This inscription is employed as a space filler, in Kufic style, and it abruptly ends in the middle of the sixth verse, due to the lack of space to fit the entire verse onto the panel. In the same monument, but during the subsequent decorative phase dated 1312-13, a different practice can be observed. For the Opening chapter inscription, in Kufic, on the stucco panel on the interior surfaces of the northern wall of the mausoleum's *iwan*, craftsmen tried to avoid the breaking of the Qur'anic verse; they completed the verse of the chapter by cramming it into the space next to the last part of the inscription. The same solution is applied for the completion of the Qur'anic excerpt in the stucco lunette panel in the mausoleum's entrance corridor belonging to the same decorative phase. Moreover, the carved stucco mihrab of the Imamzada 'Abdullah at Gudzar features a similar phenomenon, which is discernible in three out of its four Qur'anic inscriptions.⁹⁵⁹ The frequency of the phenomenon in the mihrab is indicative of the fact that craftsmen strongly desired to complete the Qur'anic verses and that this was a specific attitude rather than an exceptional behaviour.

The fact that the craftsmen desired for the stucco inscriptions to contain entire Qur'anic verses and that they in several cases did their best not to break them, is indicative of the fact that they thought that somebody will read these verses and discover the shortcomings. This provides for the primary evidence regarding the readership of epigraphic programmes in Ilkhanid monuments. Qur'anic inscriptions of monuments were likely more frequently read, than originally believed.

Conclusion

Discussed cases of craftsmen's change of mind and homage to predecessors provide for a telling insight into the mental process which took place as stucco craftsmen were producing the revetments. It is possible to conclude that the intellectual reasoning behind the production of stuccos was not dissimilar from the reasoning behind the production of European arts. Ilkhanid craftsmen reflected upon the stucco design and they were flexible in adjusting it depending on the architectural context and technical challenges. Moreover, they observed earlier revetments critically and their own works were responses to works of their predecessors. Ilkhanid stuccos should therefore not be understood as a simple technical type of a craft, but rather as an art form in its own right.

5.4 Ilkhanid Stucco Craftsmen's Workshops and their Characteristics

Fig. 89.

a.) Stucco Craftsmen's Workshop Composition and Work Division

There are two main sources of evidence for the understanding of stucco craftsmen's workshop composition: historic inscriptions on stuccos and the material evidence from carved stuccos. They allow a general picture of composition of stucco craftsmen's workshops to be reconstructed and to comprehend diverse skills, tasks and knowledge of stucco craftsmen, which were necessary for the production of stuccos. These skills and knowledge are the intellectual property which constitutes the artists' notion and are accordingly debated in this chapter.

⁹⁵⁹ The described situation likely reveals craftsmen's lesser skill in inscription design planning and transfer into the stucco medium.

Work Division in Stucco Craftsmen's Workshops – the Craftsmen's Signatures Evidence

The craftsmen's signatures provide information pertaining to signatory artists of stuccoworks. Detailed analysis of stucco production techniques, and design and colouring principles (Chapter 3, Section 3.1) in relation to other architectural revetment media, illustrates that these signatures reflect the technology of stucco production. It has been shown that craftsmen possessed the calligraphic skills necessary for production of inscriptions, or that experts had to be present *in situ* to design inscriptions; thus, the signatures on stuccos name the master stucco craftsmen rather than manuscript calligraphers. This does not hold true for tiles, woodwork or stone, where the presence of two experts, with occasional additional references to writing or designing of inscriptions is reflected in craftsmen's signatures.⁹⁶⁰

The main difference between the media stems from their dimensionality, which determined the modalities of design production. Plain, one-dimensional wall paintings were easy to produce and to replicate with stencils. Similar methods can be seen in the applied moulded and stencilled stuccos in Yazd, which could be multiplied by creating identical moulds and stencils and only necessitated the use of ground lining, incisions and rough design.⁹⁶¹ Lustre tile production⁹⁶² first required rough shaping of tiles with moulds, followed by manual production of relief inscriptions before glazing, firing and lustre application. Craftsmen therefore created more detailed inscriptions and ornamental elements in tiles, compared to what could be achieved in carved stuccos, which had to be produced *in situ*, in a vertical position, and which were limited by the time necessary for the stucco body to dry. The division of skills in the stucco craftsmen's workshops was determined by the decorative medium and it differed significantly from other media.⁹⁶³ These on-site procedures can be divided into stucco design production, preparation of the stucco body, transfer of design, followed by stucco carving and application of paint.⁹⁶⁴ This also suggests that specifications of craftsmen's professions in signatures should be understood in an indicative manner and as evidence of close ties between stucco production and the monument construction sector.

Craftsmen's Skills and Intellectual Knowledge Necessary for Stucco Production

Examination of the carved stucco revetment production process (Chapter 3, Section 3.1) allows a hypothetical estimate of skills, which the stucco craftsmen's workshops possessed in order to be able to produce the stuccos, to be proposed. It is difficult to assess whether the workshops operated in a manner for them to be independent and to be able to produce a stucco repertoire without external aid, or if they were aided by external collaborators, who held specific skills or expertise necessary for stucco production. Considering the fact that the workshops of stucco craftsmen had to be mobile, for production of stuccos in monuments, often at a considerable distance, it seems more likely that the workshops organized themselves in an auto-sufficient manner, to be able to produce stuccos independently. The size of workshops was thus determined by characteristics of the necessary skills for stucco production which were likely possessed by different members of workshops.

⁹⁶⁰ Blair 1986a, 619.

⁹⁶¹ See excellent research on these stucco artistic techniques by Alvandiyan: Alvandiyan 2010; Alvandiyan 2012.

⁹⁶² For information concerning production of lustre tiles, see Quchani 2011, 40-49.

⁹⁶³ Grbanovic 2020, 608-610.

⁹⁶⁴ *Ibid.*, 619.

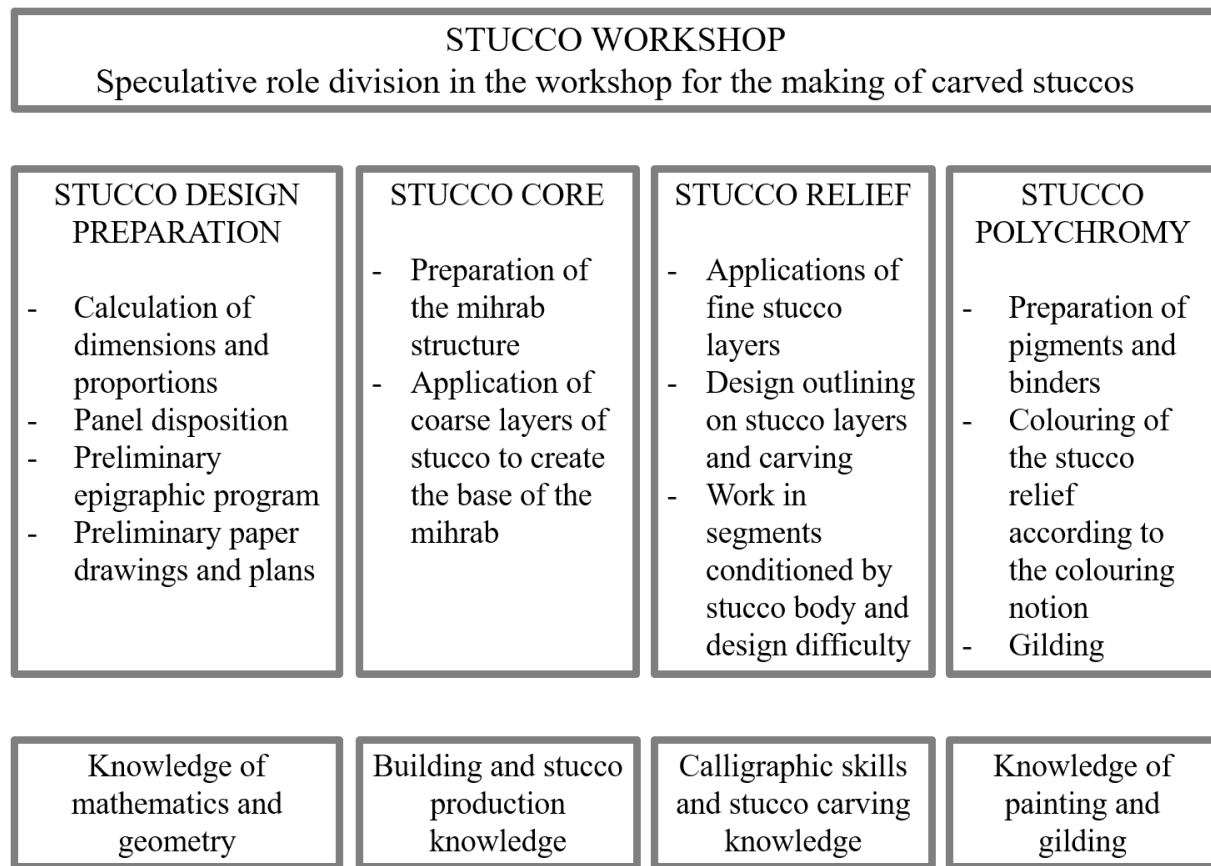


Figure 89: Hypothetical work division and necessary skills for production of carved stucco revetments.

The first stage in the production of stuccos, the revetment planning and design preparation, required the craftsmen to possess knowledge of mathematics and geometry, for them to be able to measure the architectural space, determine the dimensions and proportions of stuccos and to draw their preliminary plans. These advanced skills were likely skills of master stucco craftsmen, or at least one of the members of the workshop, who could take responsibility for the designs. This research showed that the craftsmen could have been aided by manuscript calligraphers, but that it was not them heading the workshops and that it is more likely that the master stucco craftsmen were skilled in inscription writing and production. The possibility that learned men, such as the administrators or manuscript artists aided the workshops in preparing stucco repertoire designs is plausible.

For the preparation of supporting walls and the coarse stucco layers of the revetments, the craftsmen above all needed skills related to the monument construction sector. Craftsmen needed to possess a basic knowledge of building skills in order to prepare the support for the stucco revetments. On the other hand, as mentioned, they could have been assisted by the monument builders. The documented evidence of stucco craftsmen's signatures however indicates that the craftsmen were likely often in possession of building skills and that they closely collaborated with builders. For the preparation of coarse stucco layers and for their adhesion on supporting walls, the craftsmen needed to have experience in preparing the stucco body (proportions of material, amount of mechanical working) and for segmented work in applying the layers and increasing their adhesion with nails. The described skills are basic skills, which most of the craftsmen in the workshop possessed. It however remains unclear if craftsmen prepared the raw material (lime, gypsum, talcum powder, iron and wooden nails)

themselves or if they employed ready-made material. It is plausible that raw material was produced by artisans specialized in its production and at locations where the raw material (such as gypsum) was available.

The third stage in production of stuccos concerned carving and application of stucco elements to form stucco reliefs. It has been demonstrated that the work of design transfer and stucco carving are perhaps the most specific skills which the stucco craftsmen possessed. It has also been demonstrated that it is unlikely that manuscript calligraphers took part in the stucco design process or carving. Rather, they could have aided the craftsmen in the process of stucco designing. Stucco carving and protruding stucco element application skills of craftsmen in the workshop varied, which is clearly reflected in some stucco repertoires, where more difficult work was given to the more experienced craftsmen, while apprentices were in charge of production of less significant parts of stucco repertoires. Consequently, different craftsmen's hands and skill levels are reflected in the relief and visual properties of stuccos. This division of work reflects craftsmen's pragmatism in production of stucco repertoires and the logic behind the work division. The master stucco craftsman was likely the person who supervised the process of stucco carving and might have been in charge of production of the most challenging and complex stuccos of the decorative programme.

The fourth and the final stage of stucco production consisted of stucco colouring and gilding. The earlier discussion illustrates that stucco colouring was likely performed by craftsmen of the workshops, but that gilding probably necessitated the engagement of an external expert. It is however difficult to estimate whether craftsmen prepared stucco colouring pigments themselves, or if pigments were provided ready-made by the patron or the overseer. If they needed to prepare pigments, they also had to possess specific tools for pigment preparation (grinding, filtering, etc.) and they could have been capable of producing pigments artificially. The Abu al-Qasim's treatise provides detailed information concerning the ceramics' pigment preparation knowledge and procedures in the Ilkhanid period.⁹⁶⁵ It is thus possible that stucco craftsmen's workshops retained similar skills and knowledge as the lustre tile and ceramic workshops in Kashan, or that stucco workshops could have drawn on products and supplies of pigments produced and prepared in Kashan workshops or elsewhere. Given the specific nature of pigment preparation and production process, it is more likely that stucco workshops were supplied with ready-made pigments from pigment experts. If so, this would also reveal the observed relative uniformity of stucco polychromy traces, which were documented on the Ilkhanid stucco repertoires in this work, and are discussed in detail in chapter three.

Cases of disparities in stucco production allow to hypothetically estimate the number of members of workshops. Having seen that craftsmen of differing level of skills produced stuccos, while the master stucco craftsmen supervised production and signed them, it would be reasonable to propose that an average workshop for a medium size stucco revetment repertoire likely consisted of around five stucco craftsmen. Out of these was the head of the workshop, two could be more experienced and the other two could be apprentices. The head of the workshop knew most of the skills and procedures for stucco production and could be particularly skilled in calligraphy, stucco carving and colouring. Out of the two more experienced craftsmen, one could be the expert of stucco preparation and carving and the other craftsman could be responsible for paint application. Apprentices had to learn from the craftsmen and were given less demanding tasks throughout the stucco production process. If

⁹⁶⁵ See Allan 1973.

so, craftsmen's workshop could also be aided by the other craftsmen for tasks which did not strictly concern work with stucco material, such as preparation of stucco revetment support or stucco gilding.

b.) Stucco Craftsmen's Workshops and their Relation to the Other Sectors of Monument Construction and Decoration

Relation of Stucco Craftsmen's Workshops to the Construction Sector

The most significant evidence for the comprehension of the relation between the construction sector and the stucco craftsmen's workshops is provided by observations of monuments and their relation to the carved stuccos on their surfaces. Further indications are provided by the signatures of master stucco craftsmen. This section is included in this chapter because it concerns the question of an intellectual interaction and knowledge transfer between stucco craftsmen's workshops and sectors of building and other architectural revetment media.

Stuccos and their Supporting Walls

Seljuq Friday mosques at Qurva (first monument: 1022; stuccos 1179; wall paintings are of an uncertain date) and at Sujas (late twelfth^{12th} century structure and stuccos and Ilkhanid mihrab redecoration) illustrate the interconnectedness of the construction and stucco craftsmanship' sectors. Seljuq stucco inscriptions were inserted into spaces designated for and prepared by builders, which required production of fired brick-formed cartouches or frames. This implies that stucco revetments, which were programmed, had to be planned as part of architectural surface at the time of the monument construction. If so, it is likely that stucco craftsmen were present at construction sites at the time of the monument construction. They must have communicated with the builders who were preparing spaces for stuccos. This gradually changed during the Ilkhanid period when redecoration of existing monuments became a widespread practice in place of less frequent *ex novo* constructions. Redecoration interventions could not have interacted closely with the monument's walls and transitional elements. Rather, they were applied over existing decorative programmes. Ilkhanid constructions *ex novo*, such as the Khusraw Shir Friday mosque (Cat. No. 17) indicate that the same frame and cartouche practice was employed by Ilkhanid builders and stucco craftsmen. Similar to the Seljuq period, in Ilkhanid times stucco craftsmen often interacted with the building sector.

Use of Scaffolding

Fig. 90.

Another connection between the sectors was determined by the fact that for the new constructions and decorative interventions (such as for example the Uljaytu mausoleum at Sultaniyya; Cat. No. 27) builders and craftsmen used the same scaffolding. The scaffolding was put in place as the construction of the monument progressed and the same scaffolding was employed by stucco craftsmen (and other craftsmen) in order to reach all the architectural surfaces of the monuments' interior and to decorate them. Upon the completion of constructive and decorative campaigns, scaffoldings had to be removed, by cutting away the wooden beams, which were stuck into the monument's structure. Removal of the scaffolding was most likely performed by builders, rather than revetment craftsmen. They put the scaffolding in place and the scaffolding wood was likely their property, which they wanted to keep for future commissions. These on site procedures indicate that there needed to be constant communication

and planning between builders and craftsmen responsible for production of architectural revetments.



Scaffolding remains and the first decorative phase.



Scaffolding remains and the second decorative phase.



Scaffolding remains penetrating first and second decorative layer. The modern scaffolding in the interior of the mausoleum.

Figure 90: Evidence of use of the original scaffolding for production of two decorative revetment phases in the Uljaytu mausoleum at Sultaniyya.

Structural Solutions

Further evidence of constant collaboration and interconnectedness of stucco craftsmen's workshops and the construction sector is provided by observation of structural and decorative solutions when monuments were modified or enlarged. These solutions often go hand in hand, and revetments in carved stucco or other media were frequently employed to conceal structural imperfections of monuments. For such solutions to be put in place, builders and stucco, or other craftsmen, had to communicate closely and to collaborate on sites.

Some examples of these solutions are presented by the Pir-i Bakran mausoleum (Cat. No. 2), the Small mihrab in the Isfahan Friday mosque (Cat. No. 1) and the shrine of the 'Abd al-Samad complex at Natanz (Cat. No. 12). At Pir-i Bakran, the monumental stucco mihrab (by 1303-04) was employed to close off the opening of mausoleum's *iwān*. Its installation was performed in conjunction with construction of its wall support and the installation of separation grills to flank the mihrab and to entirely close off the *iwān*. The Small Ilkhanid stucco mihrab at the Isfahan Friday mosque was installed in an area which previously served as the main passage corridor between the mosque's south-eastern prayer hall and the entrance corridor. The mihrab installation served not just to indicate the direction of prayer, but also to conceal the closed off passage. Similar occurred at the 'Abd al-Samad complex, where in the shrine structure, the opening in the *qibla* wall was closed off and the lustre tile mihrab was installed against it.

Stucco Material Evidence

Stucco craftsmen had to employ specific raw material for production of stucco revetment layers and reliefs. This material was partially related to the materials employed for the fired brick adhesion mortar used by builders. It is thus possible that builders and stucco craftsmen shared ways of obtaining raw materials for monument construction and decoration. Or perhaps, the supplying of the raw materials could have been centrally organized by the overseer of the construction site.

Evidence of Craftsmen's Signatures

Some stucco craftsmen's signatures comprise professional appellatives, which, as indicated in this research, should be interpreted as honorary titles partially indicating the ties between the carved stucco production workshops and other crafts and building sector (see Chapter 4, Section 4.2). The Damghani family signatures are produced in carved stucco and terracotta media (at the Kashana tower in Bistam; Cat. No. 18) and they mention professions such as engineer (*muhandis*), builder (*banna'*) and plaster carver (*jassas*). Further appellatives on other signatures, such as the mihrab of the Marand Friday mosque (Cat. No. 22) comprise the appellative *bandigir* (builder). And the signature at the Pir-i Bakran mausoleum (Cat. No. 2) contains *naqqash* (designer). *Bandigir* and *naqqash* are unique cases of appellatives in carved stucco medium, but *banna'* and *muhandis* occur more frequently. *Jassas* occurs only once (the Uljaytu entrance portal of the Bayazid Bistami complex; Cat. No. 19) and it indicates that there existed an expression to denote plaster working, which was however not employed by the majority of signatory craftsmen. The Damghani family members used the three appellatives (*muhandis*, *banna'* and *jassas*) interchangeably rather than in a consistent manner. Moreover, in some cases they signed stuccoworks with a combination of appellatives (e.g. *al-muhandis*, *al-banna'*) which additionally highlights the ties between the sciences of geometry, construction and stucco production. It is interesting to note that wall painting repertoires were signed with a lesser frequency, compared to carved stuccos.⁹⁶⁶ Furthermore, for the applied moulded and stencilled stuccos, none of the repertoires (Sultaniyya, Yazd, etc.) are signed at all. This lesser frequency of signatures in the given media should be understood as a different artistic practice which sets the workshops of these media apart.

Conclusion

The outlined evidence indicates ties and existence of communication and intellectual exchange between separate sectors of monument construction and decoration and the possibility that stucco craftsmen were also engaged in monument construction procedure, as already indicated in earlier discussion. It seems that the Damghani family dealt with revetments in terracotta and stucco and also performed construction works. This informs that, rather than metalwork, wall painting, applied moulded stucco or ceramic art, stucco craftsmanship was more closely tied to the art of monument construction. The described knowledge and know-how were transmitted through generations of craftsmen and between these sectors. In the case of the Damghani family (consisting of the father and two sons), the knowledge was transmitted within the family circle and possible associates. Similar evidence in carved stone medium, presents another example of

⁹⁶⁶ For the Ilkhanid and late Ilkhanid period there are only two known examples of signatures in the wall painting medium: at the *Qadamqah* at Farasha near Abarquh (the wall paintings date to around 1300) and the wall painting redecoration of the Gunbad structure at Turbat-i Shaykh-i Jam complex (Cat. No. 30) which took place sometime between 1332 and 1370.

a family tradition of professional tombstone carving in the Kazirun area.⁹⁶⁷ Such family ties might have been stronger in the sector of lustre wares and ceramics in Kashan.

c.) Relation of Stucco Workshops to the Other Revetment Workshops

Observations of Ilkhanid architectural revetment repertoires, especially of production technology and design differences between these revetment media,⁹⁶⁸ allow the nature of the relationship between carved stucco workshops and the workshops of craftsmen of revetments in other media to be established. In other words, observations of revetments can establish how much stucco craftsmen interacted with workshops of the other media and to which degree the transfer of knowledge and artistic exchange occurred between them. The understanding of these intellectual interactions is of utmost significance for the comprehension of stucco craftsmen's artistic notions addressed in this chapter. Another research question concerns the degree to which raw material and the revetment production know-how were exchanged between these workshops.

Evidence of Revetment Repertoires' Characteristics

This research demonstrates that the majority of monuments was decorated in one phase, in some cases with a combination of two revetment media (such as the combination of wall painting and applied moulded and stencilled stuccos: monuments of Yazd; Cat. No. 29, Sultaniyya; Cat. No. 27, the Ushturjan Friday mosque mihrab; Cat. No. 3, and the applied moulded stuccos in the pre-Ilkhanid domed chamber of the Pir-i Bakran mausoleum; Cat. No. 2). The monuments, which comprise decorative repertoires consisting of multiple media, have been redecorated several times. Redecoration campaigns for installation of revetments and the selective nature of redecorations, determined accumulation of different media revetments in monument interiors and exteriors. Some examples are the Farumad Friday mosque (Cat. No. 16), the Pir-i Bakran mausoleum (Cat. No. 2), the 'Abd al-Samad complex at Natanz (Cat. No. 12) or the Pir Husayn Khanqah (Cat. No. 25). The revised understanding of characteristics and sequence of redecorations, and accordingly of decorative repertoires, indicates that most frequently, one decorative intervention in a monument comprised production of revetments in one artistic form. This means that craftsmen's workshops of different media mainly worked in isolation from each other. But this does not exclude the possibility that craftsmen observed the extant media in monuments they redecorated, or that they could have observed and studied monuments as part of their profession. Nevertheless, the fact that craftsmen's workshops worked in isolation is also reflected in differences of visual characteristics (ornamental elements and revetment design) of the revetments they produced, their production technology, design transfer and design characteristics.

Evidence of Revetment Production Technology

The earlier discussion of differences between the revetment media (see above) illustrates that different revetment media were produced with distinct technology and that their aesthetic appearance was up to a certain point determined by the limits of modality of their production. The production technology for the revetments was partially inherited by craftsmen from their predecessors, and they developed it further. Differences in solutions for revetment making, such

⁹⁶⁷ The case is discussed by al-Hikmayi. See al-Hikmayi 1993a; al-Hikmayi 1993b; al-Hikmayi 1994; al-Hikmayi 1995.

⁹⁶⁸ For comparative discussion of design of Islamic architectural revetments, see Kana'an 2008. For a general overview of the topic, see Clévenot and Degeorge 2000. For comparative case studies see Milwright 2001.

as the modality of design production and transfer, and the procedure of revetment making, illustrate the differences between workshops of different media and indicate that the technology was mostly developed for each medium separately. This also indicates that workshops worked separately, rather than collaboratively. Perhaps the only exception is the connection between the wall painting and applied moulded and stencilled stuccos, which were often combined (see monuments of Yazd and Sultaniyya; Cat. Nos. 27, 29). This combination of the media was however possible due to the similarities in production of their design, the level of pre-fabrication and the manner in which they were applied on architectural surfaces.

Evidence of Revetment Design Transfer

The modality of revetment design transfer from an envisioned drawing or sketch into the medium of architectural revetments, from a small to a considerably larger dimension, was determined by the materiality and characteristics of revetment media. It represents one type of evidence indicating that workshops responsible for production of revetments in distinct media retained different on-site procedures, which they developed on their own, rather than in dialogue with the other workshops, which produced distinct revetments. The revetment design transfer and production modalities determined the differences in their aesthetic features (see below). This is best illustrated by the evidence of stencil use.

Use of stencils for transfer of design into the wall painting and applied moulded and stencilled stucco media was a common practice. It greatly differs from design transfer into carved stucco medium, which was performed free-hand and with the aid of grids, baselines and on several different and consecutively carved stucco material layers, rather than on a single visual plane. Use of stencils for wall paintings and applied moulded and stencilled stuccos also enabled their partial prefabrication and production of a more detailed design. For the glazed, moulded and lustre tile revetment media, the procedures were in most aspects different, due to their material properties and the modality of production.

Tile revetments required their production to be performed in fixed workshops, rather than on the monument site, with several stages of firing and ornamentation application through moulding and hand working of stone paste and by applying the underglaze and over glaze polychromy. Tile revetments accordingly achieved smaller dimensions and the modality of their production determined their more detailed design and more minute ornamental compositions. Moreover, stencils or detailed sketches were easier to employ and to transfer into the revetment medium.

The carved stucco medium was thus closer to production and design modalities for the working of stone, terracotta and marble. In these media, the design transfer was also performed with the aid of grids and baselines, and the inscription designs in stone and terracotta reveal similar design shortcomings to those documented on carved stuccos. It is accordingly possible to conclude that design production and transfer knowledge were exchanged between the carved stucco and stone and terracotta craftsmen, rather than the craftsmen who produced wall paintings and applied moulded and stencilled stuccos or tiles.

Evidence of Revetment Aesthetics

Differences in revetment media design preparation and transfer determined characteristics of revetments' aesthetic appearance and the principles of design behind them. The discerned divergences illustrate that craftsmen did not exchange the knowledge of designing media of

different revetments. Alternatively, the transfer of knowledge and know-how was limited by the properties of the revetment media which conditioned the design principles' modalities. Aspects of stark difference between the media have been documented: the level of detail of composition and the modality of repartition and mirroring of designs. This evidence nevertheless illustrates that craftsmen observed the works of their counterparts and that there did exist some shared aesthetic aspects between revetments of different media.

Revetment Detail

Differences of the revetment design and ornamentation detail were impacted by the materiality of revetments, their production technology and scale. Although some ornamental elements, such as palmettes, half-palmettes, knotted elements of inscriptions or floral scrolls are found in most of the revetment media, the level of detail of their production and the modality of their depiction differ. Large dimensioned repertoires in wall painting and applied moulded and stencilled stuccos could be produced with lesser detail, compared to reduced scale revetments such as carved stuccos or glazed tile media. Lustre tiles were produced on the smallest scale, due to their complex and resource demanding production technology. This technology however enabled the craftsmen to produce revetments with minute and detailed designs, which presented the focal points of numerous revetment repertoires. It is particularly significant that their design was produced in several stages and by different means, starting with moulding, free-hand forming of relief inscriptions and later underglaze colouring and lustre application. This enabled designs to be produced on several visual planes with numerous details of small dimensions. It was more challenging with stuccos, where the time for their production was determined by the stucco drying. Moreover, fabrication of tiles in workshops in horizontal position was more comfortable, compared to production of stuccos on monument sites and often in elevated locations or on curved surfaces.

Design Repetition

Design repetition principle occurs more frequently, compared to design mirroring. It is most often encountered in the media of revetments, which were produced by the means of design transfer with stencils. In fact, use of stencils enabled copying and infinite repetition of a desired design. The repeated design was often an inscription of historic content or with invocations to God, which repeated. The most suitable media, in which design repetition is best visible and most often encountered are wall paintings and applied moulded and stencilled stuccos. Well visible repetitions of designs have been documented at the Rukniyya in Yazd (repetition of *the Dominion belongs to God*, in inscriptions framing the transitional zone elements; Cat. No. 29) and the repetition of the name of the patron of the Uljaytu mausoleum at Sultaniyya (reading: *Sultan Muhammad Uljaytu*; Cat. No. 27). This design principle was employed in carved stucco medium only at a reduced scale and in a smaller number of cases, one example being the Square Kufic repetitions of *the Dominion belongs to God*, employed as a visual element in abstracted vegetal compositions of the mihrabs' stucco panels of the Pir-i Bakran mausoleum (Cat. No. 2), the Usturjan Friday mosque mihrab (Cat. No. 3) and the Farfan Friday mosque (Cat. No. 5). The principle was however not employed in other inscription styles or on a larger scale.

Design Mirroring

Fig. 91.

Design mirroring practice was documented in diverse media, where more complex designs were mirrored or made to appear as if they were mirroring each other. This operation of design production was more complex, compared to composing unique designs with a vertical symmetrical axis, which are often encountered in carved stucco medium. Design mirroring has been documented above all in revetments, which were produced with the aid of stencils. Stencils could be easily placed next to each other, for the designs to repeat or mirror each other, when stencils were reversed or even folded. The best example is provided by inscriptions with invocations to God (such as *the Dominion belongs to God*, and especially: *but Allah will spare you their evil*⁹⁶⁹) on monuments of Yazd (Cat. No. 29). Blair correctly emphasizes that this invocation could be employed for specific inscription and composition designs due to its length and the rhythmic form of its letters.⁹⁷⁰



Figure 91: Example of invocation inscription design mirroring in wall painting medium at the Rukniyya complex in Yazd.

The most telling example of a form of mirroring of this invocation is presented by the pair of lustre mihrabs or tomb covers (one of them dated 1310) produced in Kashan presumably for the Uljaytu mausoleum at Sultaniyya (stored in the Gulbenkian collection, Inv. No. 1567; Cat. No. 27) and the Natanz complex (now in the Metropolitan museum of Art, New York, Inv. No.

⁹⁶⁹ The use of this invocation and its design in lustre tile medium has recently been discussed by Blair. Paper presented at the conference *Inscriptions from the Islamic World*, American University in Cairo, September 6-8, 2019.

⁹⁷⁰ Sheila Blair, Paper presented at the conference *Inscriptions from the Islamic World*, American University in Cairo, September 6-8, 2019.

09.87; Cat. No. 12). The two sets of tiles were likely produced with the same mould and they display a specific arch design, by means of rendering the invocation more symmetrical and folding it in two parts to form the arch in a manner for the two halves of the invocation to almost mirror each other. Production of such design was possible with extensive design planning, and its “folding” and transfer into the lustre tile medium were enabled by stencils. Such a type and complexity of design has not been encountered in Ilkhanid carved stuccos, but a case of equally complex design and its mirroring has been spotted in the tripartite carved stucco mihrab of Nur al-Din mosque in Mosul, which is dated 1170-1174 (now stored in the National museum of Iraq, Baghdad).⁹⁷¹ In Ilkhanid carved stuccos, the same invocation occurs twice: at the mihrab of the Farumad Friday mosque (Cat. No. 16), where it forms geometrical medallions by the means of its repetition, and in the corners of the framing band of the monumental carved stucco mihrab of the Bayazid Bistami mosque of the complex (Cat. No. 19). In these cases, the possibility of mirroring and repeating the invocation is exploited to a lesser extent, compared to the lustre tile and wall painting media. A monumental example of invocation mirroring and repetition has been documented in the Rukniyya mausoleum in Yazd (Cat. No. 29), where the invocation has been produced in wall painting and applied moulded stuccos, in transitional zone elements.⁹⁷² This mirroring was performed on two levels: by repeating the design twice in every transitional zone element, and across the architectural space by means of juxtaposed transitional zone elements. This design principle and its complexity has not been documented on carved Ilkhanid stuccos.

Revetment Observations by Stucco Craftsmen – Artistic Inspiration?

Documentation of monuments and comparison of revetments in diverse media revealed that there exist certain design similarities between revetments in different media. Specifically relevant are aspects of related design found in lustre tile and carved stucco media. These similarities do not indicate collaboration of craftsmen or direct exchange of knowledge between workshops. Rather, these similarities seem to be results of craftsmen’s observations of revetments in different architectural contexts, which might have prompted adoptions and adaptations of designs in the two media and therefore transfer of artistic notion. The study of mihrab panel divisions and designs of mihrabs in lustre tile (the lustre mihrab from the Maydan mosque in Kashan, now in the Berlin Museum of Islamic Art, Inv. No. 5366, dated 1226) and carved stucco (the Uljaytu mihrab, Isfahan Friday mosque, Cat. No. 1) reveals that the two mihrabs feature closely related designs in terms of panel divisions and dispositions of inscriptions and vegetal compositions across the panels. The two mihrabs differ in size, but the similarities in their design might reflect the fact that stucco craftsmen observed works of lustre potters and vice versa.⁹⁷³ Other examples of similar design and aesthetics between the two media are presented by the dadoes of the Pir-i Bakran mausoleum (in carved stucco and tiles; Cat. No. 2) and the shrine of the ‘Abd al-Samad complex at Natanz (in lustre and glazed tiles; Cat. No. 12).

⁹⁷¹ This mihrab reveals inscription design of forms and types not encountered in the Ilkhanid carved stuccos. This could be the result of the different provenance of stucco craftsmen’s workshop and their different procedure for the mihrab design preparation and transfer.

⁹⁷² In the same monument, the mirroring principle is employed also for the ground design of the revetments covering the interior of the mausoleum’s dome shell.

⁹⁷³ Lustre tile mihrab designs are more repetitive and similar to each other due to the use of moulds for their production, compared to carved stuccos. It is thus more likely that stucco craftsmen copied works of lustre potters, rather than the other way around.

Exchange of Raw Material and Expertise

There is little information concerning sources and exchange of raw materials for production of carved stuccos and other revetments. It is also difficult to assess how much the raw materials and the expertise in production of revetments were exchanged between workshops. These are some of the aspects of stucco revetment production which are difficult to answer, due to the lack of substantial evidence.

Two hypothetical modalities of obtaining raw materials for the carved stucco production can be proposed. It would be logical that raw materials, due to the need to have an overview of their amount and costs, would have been estimated by the overseer of the constructive or decorative interventions, in communication with craftsmen who produced the plan for the revetment repertoire and monument's structure. Subsequently, the overseer organized the acquisition of material through personal networks and supplied the craftsmen with them. It is equally possible that craftsmen's workshops themselves were in charge of obtaining the necessary materials, because they knew exactly what they needed, and in what amounts. If so, craftsmen could have had their personal networks of suppliers of raw materials and could have also exchanged or traded them with other workshops. It is also plausible that external collaborators of workshops (for example, experts in gilding) provided the necessary material themselves, due to the specificity of material and its technological characteristics (for example: metal leaf for gilding).

The extant but so far scarce knowledge of material characterization of stucco and other revetments (see Chapter 3; Section 3.2) indicates that in the Ilkhanid period, the employed pigments for stucco, applied moulded and stencilled stucco, lustre tiles and other revetments were closely related and often included use of the same pigments and perhaps also adhesives and other necessary material.⁹⁷⁴ This is different in comparison to the earlier eras in which wider spectra of pigments were employed for carved stucco colouring.⁹⁷⁵ Similar pigments were thus employed for rendering polychrome different kinds of revetments; this could indicate that during the Ilkhanid period there existed a centralized system for supplying pigments, maybe from Kashan, the tile production centre, at a large settlement bazar or even a state institution. This could also indicate that, indeed, craftsmen of different workshops exchanged or traded raw materials amongst themselves and they might have exchanged technical knowledge for revetment colouring which impacted stucco craftsmen's notion of stucco colouring.

External Collaborators of Stucco Craftsmen's Workshops

The earlier section of discussion illustrates that stucco craftsmen's workshops collaborated closely with the monument construction sector. Moreover, it has been shown that craftsmen likely exchanged knowledge and practices of revetment design and production with workshops of stone, marble and terracotta revetments, rather than tiles, wall paintings or applied moulded and stencilled stuccos. It is now necessary to estimate whether the entire carved stucco production process was performed by members of workshops, or if external collaborators would also be engaged and would bring additional artistic notions to the heart of stucco craftsmen's workshops.

⁹⁷⁴ Compare information on pigments employed for carved stucco and wall painting media: Isfahani *et al* 2010 and Boroujeni *et al* 2013. See also Younessi *et al* 2017; Younessi *et al* 2015.

⁹⁷⁵ In the period between 10th and 12th centuries, a wider spectrum of pigments was employed for carved stucco colouring. See, for example: Karimy and Holakooei 2015; Holakooei *et al* 2016.

For preparation of stucco revetment design, which included panel division, dimensions of revetments, their proportions, inscriptions and ornamental compositions, the craftsmen likely retained their own procedures and repertoires of ornamentation. It is however plausible that they were aided by a calligrapher, or a person employed in the Ilkhanid Empire's administrative system, for the preparation of the inscriptions and the epigraphic programme. These external collaborators were assistants or aides to the project, but they contributed specific artistic knowledge to the stucco workshops, and they impacted the final aesthetic characteristics of the carved stucco revetments. The preparation of support for the revetments was likely work of collaboration between stucco craftsmen and builders. But as shown above, the stucco craftsmen likely possessed building and construction skills themselves and could perform these tasks independently, to a certain extent. On the other hand, preparation of coarse layers of stucco for the revetments was an independent work of stucco craftsmen, which constituted part of their specific expertise. Similar applies to the stage of production of fine layers of stucco reliefs and their carving which were produced in segments. Stucco colouring was also performed by the members of the craftsmen's workshop, which is revealed in the uniformity of occurrence of stucco colouring principles across the given geographical and chronological contexts. This uniformity might provide evidence for indicating that there was a dialogue between diverse stucco workshops or that craftsmen observed and studied each other's works. As mentioned, lesser frequency of gilding, and its appearance in different media, might be the result of the fact that experts in possession of specific skills and tools had to be summoned as external collaborators at this stage of stucco production. These external collaborators impacted the aesthetics of produced stuccos and added specific knowledge to the workshops' bulk of artistic practices, skills and notions.

Conclusion

The architectural revetment craftsmen's workshops mainly worked in isolation from each other, but they did observe revetments produced in other media, and partially adopted their design solutions. Carved stucco craftsmen's workshops were closely related to the building sector, and the workshops which produced revetments in terracotta and carved stone. There seems not to have been a lot of interaction between stucco workshops and workshops in charge of production of wall paintings, applied moulded and stencilled stuccos and tile revetments, but craftsmen likely observed each other's works through which they increased and changed their artistic knowledge and works. Craftsmen thus observed works of other workshops and partially adopted design solutions into the other media, as determined by the material and production process limits. For stucco production, occasionally, stucco craftsmen collaborated with external experts such as gilders and builders, who added additional knowledge to workshops and impacted the aesthetics of the stuccos. Stucco craftsmen exchanged knowledge and expertise with these artisans, who might have also supplied them with raw materials for stucco production and with whom they might have exchanged knowledge of revetment colouring notion. Further research would be necessary in order to understand how stucco works were perceived by the faithful or visitors to the monuments where stuccos are located.⁹⁷⁶

⁹⁷⁶ See, for example Necipoğlu 2015.

Chapter Six: Ilkhanid Architecture, Stuccos and their Aesthetics - Conclusions

Introduction

This chapter presents final discussions and conclusive remarks regarding the main research questions addressed in this research work. It provides examination of diverse aspects of Ilkhanid carved stucco revetments: their visual form and aesthetic characteristics and their peculiarities in a wider context: function of stucco revetments in relation to the monuments they adorn, their visual characteristics and epigraphic content and their meaning as reflected in their locations, dimensions and inscriptions. The chapter proposes a contextualized reflection concerning the aesthetics and style of Ilkhanid stuccos, which is followed by a summary of information regarding their specific traits and the significance and characteristics of Ilkhanid monuments with carved stucco revetments. It also proposes information regarding Ilkhanid innovations related to the carved stucco revetments and the Ilkhanid legacy of architectural revetments.

6.1 Form and Aesthetics of Ilkhanid Carved Stucco Revetments

a.) Towards a Stucco Artistic Techniques' Taxonomy

Figs. 92-95.

Earlier chapters (see Chapter 3; Section 3.1) illustrate the basics of production technology of carved stucco revetments. It is now necessary to understand what were the specific developments of stucco art and its production technology which took place during the Ilkhanid period.

One of the perhaps oldest, technologically least demanding and most frequently employed stucco artistic technique, consists of carving one fine layer of stucco body. The design for the stucco was applied on the surface and subsequently the relief was formed by carving – subtraction of stucco material. Then the relief was coloured. Although there were more complex stucco artistic techniques in the Ilkhanid period, this technique continued to be frequently employed across the Empire for different types of commissions (for example the stuccos of the Damghani craftsmen's workshop: Cat. Nos. 18-21). In the Early Islamic period, as indicated by the examination of carved stuccos at the Na'in Friday mosque (late 10th century?),⁹⁷⁷ carving of one stucco layer developed into a more complex artistic technique, which comprised division of stucco design in several visual planes and its application on consecutively applied and carved stucco layers. Production of stucco relief by means of carving of two or more layers of fine stucco became widespread during the Seljuq and Ilkhanid periods, when it was employed across the Iranian territory.

Further techniques were developed by means of addition of stucco layers and material to carved stucco reliefs. One such technique, which seems to have been invented in the Seljuq period, is the application of applied protruding elements onto one carved stucco layer.⁹⁷⁸ The technique became more frequently employed in Ilkhanid times. A development specific to the Ilkhanid period is the frequent use of techniques, which comprised carving of two or more stucco layers,

⁹⁷⁷ Qasimi 2004, Vol. 8, 78-85; <https://archnet.org/sites/1644> (Last Accessed: May 3, 2021).

⁹⁷⁸ One of the earliest cases of this artistic technique is featured on the monumental stucco revetment programme of the Ribat-i Sharaf caravanserai in north-eastern Iran (rebuilt and redecorated in 1154-1155/549). See Kiyani 1981; <https://archnet.org/sites/3873> (Last Accessed: May 3, 2021).

which were often combined with applied protruding elements.⁹⁷⁹ A specific technique, characteristic of Ilkhanid stuccos, but dating back to the Early Islamic period, was the production of an undercut stucco relief, which consisted of several carved layers of stuccos.⁹⁸⁰ A separate development, which took place in the Ilkhanid period, but was confined to central Iran and not widespread, was the production of revetments out of carved stucco combined with glazed elements.⁹⁸¹ Perhaps it could be considered as a precursor of the tile mosaic medium, which began to be used by Ilkhanid artisans and fully flourished in the Aq Quyunlu (1378-1501) and Timurid (1370-1507) periods. Two more types of separate artistic technique developments, which might have occurred in conjunction with the redecoration of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27) and which were specifically widespread in Muzaffarid Yazd (Cat. No. 29), were techniques of applied moulded and stencilled stuccos, which are loosely related to the art of wall painting, with which they are occasionally combined.⁹⁸²

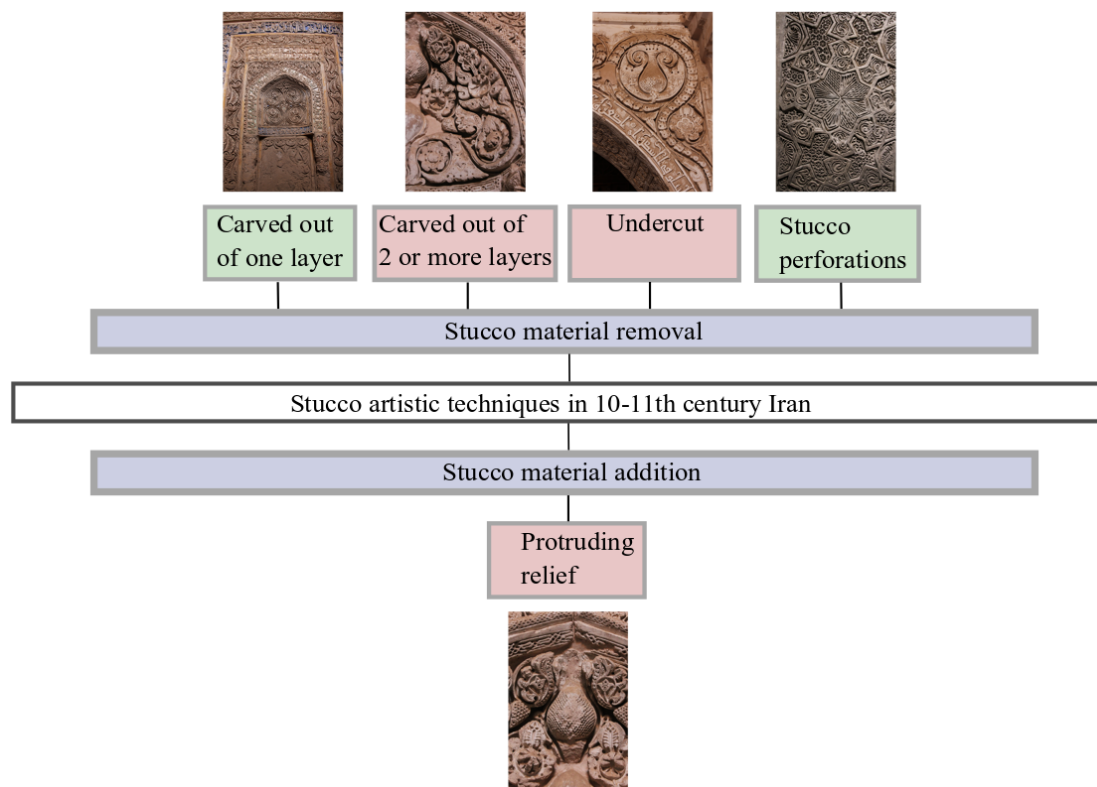


Figure 92: Most frequently employed stucco artistic techniques in the tenth and eleventh centuries. Techniques marked with red are technological inventions which took place in this period.

⁹⁷⁹ A good example are the monumental spandrels of the Uljaytu mihrab at the Isfahan Friday mosque (Cat. No. 1).

⁹⁸⁰ Stucco undercutting technique likely required the preparation of a different stucco body, which enabled its production. The technique was particularly widespread in the Isfahan area, although it is also found on stuccos of other regions of the Ilkhanid Empire. Some of the best examples are found on the stuccos of the Pir-i Bakran mausoleum (Cat. No. 2), the Haftshuya Friday mosque mihrab (Cat. No. 3) and the Ushturjan Friday mosque mihrab (Cat. No. 4).

⁹⁸¹ Such revetments were so far documented only in the Ushturjan Friday mosque (1315-16 redecoration and rebuilding) and the Pir-i Bakran mausoleum (third decorative intervention: 1312-13).

⁹⁸² The best examples of such revetments are found in the Sultaniyya mausoleum of Uljaytu (second decorative phase: c. 1316/20; Cat. No. 27), Rukniyya and Shamsiyya complexes in Yazd (Cat. No. 29) and on a minor scale at the Ushturjan Friday mosque (the lower portion of the mihrab; Cat. No. 4) and the Pir-i Bakran mausoleum (third decorative stage: 1312-13, in the small domed structure; Cat. No. 2).

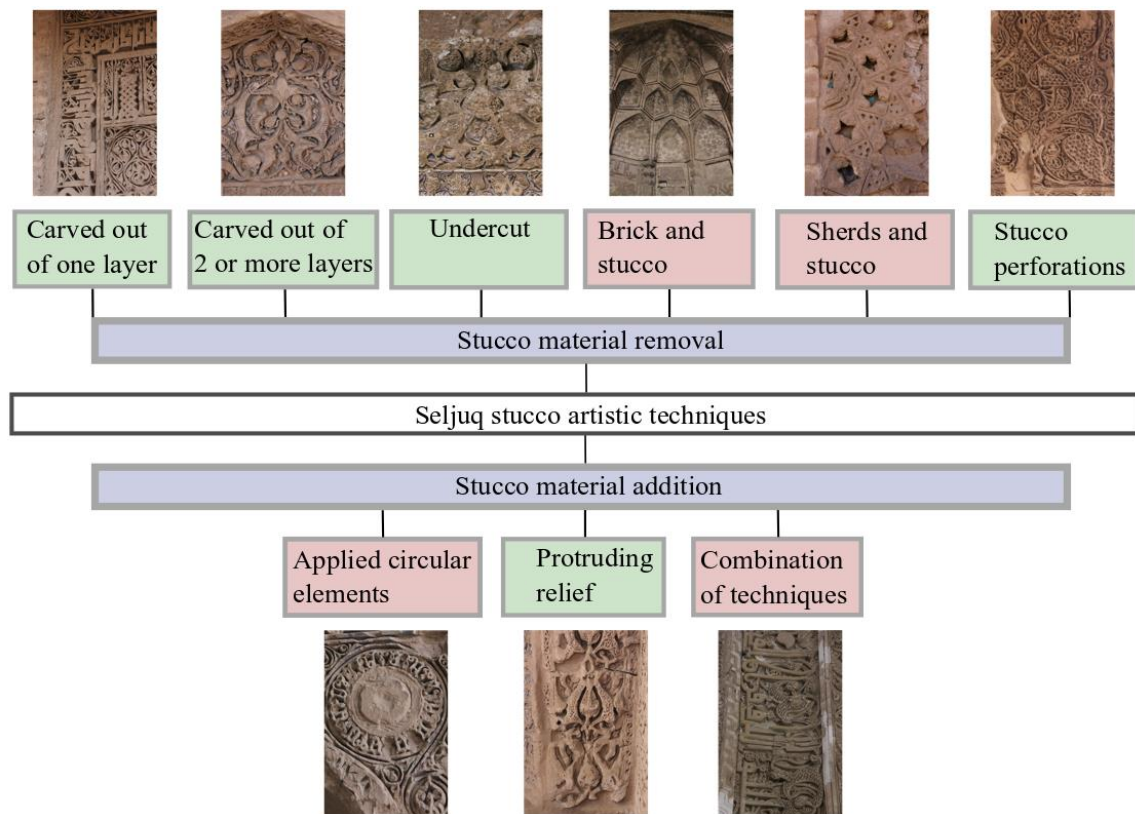


Figure 93: Most frequently employed stucco artistic techniques in the Seljuq era. Techniques marked with red are technological inventions which took place in this period.

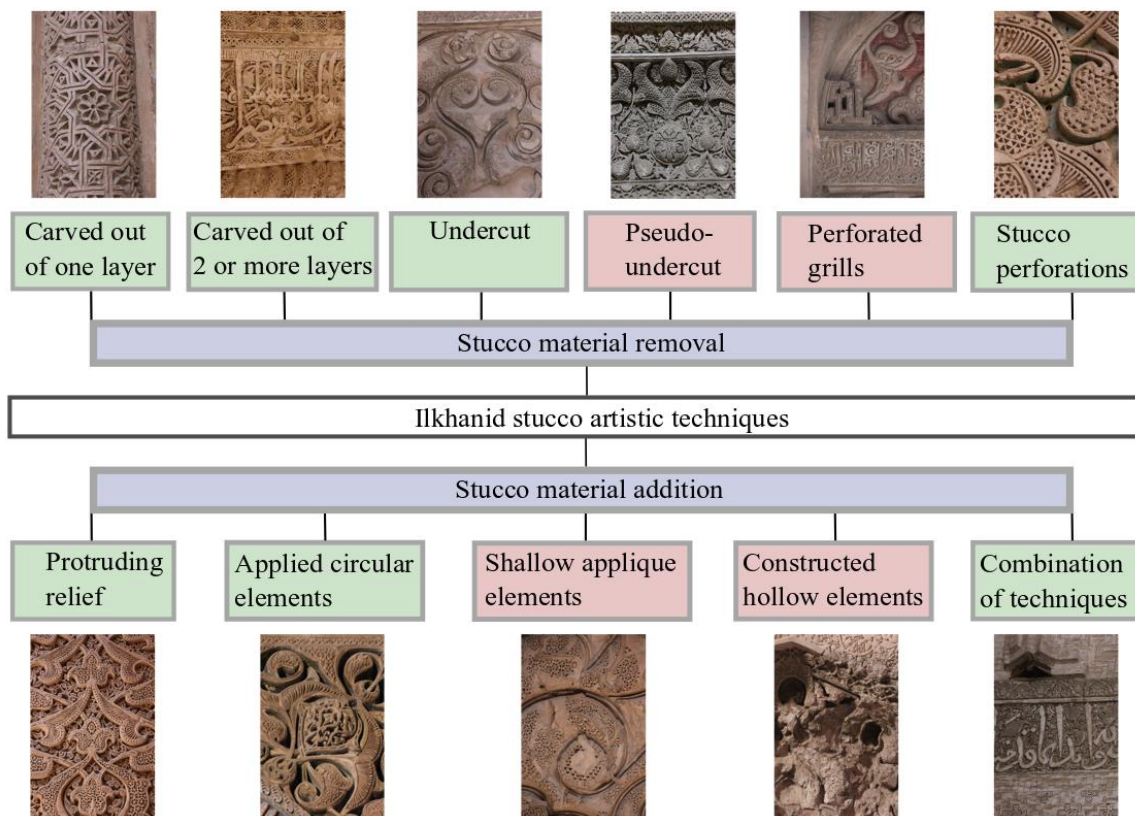


Figure 94: Most frequently employed stucco artistic techniques in the Ilkhanid period. Techniques marked with red are technological inventions which took place in this period.

A hypothetical theoretical model of technological development of the described carved stucco techniques can accordingly be proposed. Development of diverse stucco artistic techniques was a process which took place over a long time period, beginning in pre-Islamic times and continuing beyond the Mongol conquest, into the Ilkhanid period, through transfer of knowledge of stucco art through apprenticeship in stucco workshops and between generations of stucco craftsmen. The oldest techniques comprised carving of one layer of fine stucco body. Gradually, stucco carving and design transfer developed into numerous techniques, which required carving of several consecutively applied layers of stucco and application of different types of protruding elements. Similar development of artistic techniques of stucco took place in other Islamic lands, more or less simultaneously, as a convergent evolution, which may have been partially impacted by migration of craftsmen between the Islamic lands and consequent transfer of knowledge.⁹⁸³ Nevertheless, regional differences in stucco production technology do exist; they are frequently substantial and they would need to be addressed in a separate study.

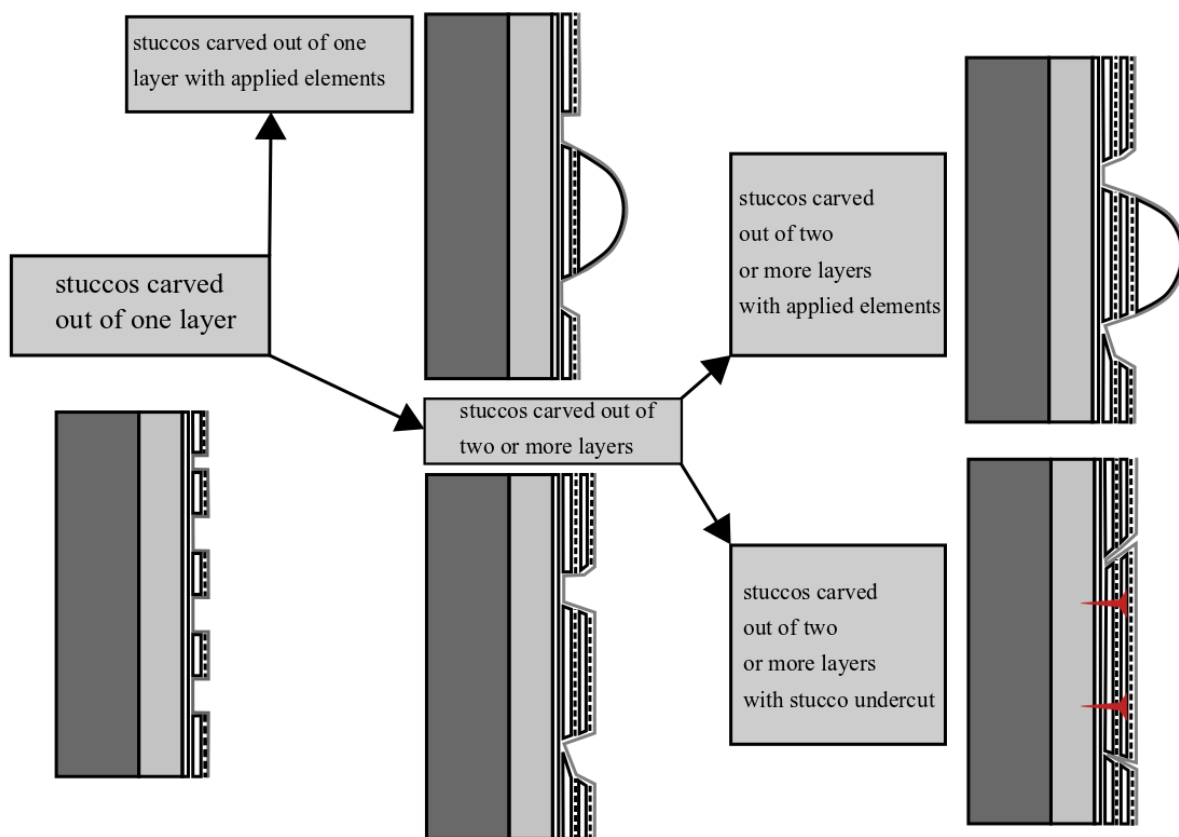


Figure 95: A hypothetical theoretical model proposing the possible manner of development of stucco artistic techniques which took place between the tenth and fourteenth centuries.

In the Early Islamic period, stuccos were already carved out of several layers. Occasionally, stucco undercut was also performed, and their surfaces were heavily perforated with different tools. Some stuccoworks were already characterized by protruding reliefs, which involved rudimentary application and carving of thick layers of fine stucco. In addition, new artistic techniques were developed in the period of the Great Seljuq Empire. Among these, a combination of fired brick, terracotta and stuccos, and combinations of carved stucco with

⁹⁸³ See Korn 2003.

glazed elements can be considered typically Seljuq.⁹⁸⁴ In this period, stucco artistic techniques were more frequently used to produce more variegated reliefs and it seems that for the first time, applied protruding reliefs came to be employed on stuccos carved out of one or more layers. Stucco relief thus developed depth.

The majority of stucco artistic techniques, which were in use in the Seljuq period, such as carving of several stucco layers, application of protruding elements and stucco undercut, continued to be used by Ilkhanid craftsmen, to whom the stucco production technology was passed on through the generations. Other techniques, such as fired bricks or terracotta and stucco, and glazed sherds and stucco,⁹⁸⁵ slowly died out. They gave way to Ilkhanid inventions, such as the pseudo-undercut stucco,⁹⁸⁶ perforated grills,⁹⁸⁷ shallow appliqué elements⁹⁸⁸ and application of constructed hollow elements.⁹⁸⁹ Moreover, separately, new techniques such as applied moulded and stencilled stuccos, and stucco and glazed elements combinations, emerged during then Ilkhanid period.⁹⁹⁰ These frequently employed carved stucco techniques were thus partially inherited from pre-Ilkhanid times, and some of them were new technological inventions, which might have been impacted by imperial commissions, such as the construction of Uljaytu's capital of Sultaniyya and his mausoleum. Invention of applied moulded and stencilled stuccos and more frequent use of wall painting medium towards the end of the Ilkhanid period might reflect craftsmen's innovations tied to labour and time saving. Similar emergence of new artistic techniques for mass production and pre-fabrication is observed in the Timurid period with the prevalence of tile mosaic, proliferation of tile use in the Ottoman Anatolia or stuccos produced with stencils, moulds and less demanding artistic techniques in Marinid Maghreb and in the Iberian peninsula.⁹⁹¹

Other Significant Characteristics of Ilkhanid Stuccos

Fig. 96.

In addition to the development of stucco production techniques, the stuccos of the Ilkhanid period were also characterized by a different aesthetic appearance and further differences, compared to pre-Ilkhanid stuccos. Inscription styles for epigraphic programmes of Ilkhanid stucco repertoires changed. Square Kufic inscriptions of distinct types became particularly frequently employed in the Ilkhanid period. Other styles, such as Floriated Kufic, slowly

⁹⁸⁴ The best examples of such revetments are found at the Friday mosque of Gulpayigan (1105-1118) and the unfinished revetment repertoire of the Barsiyan Friday mosque near Isfahan (1105, 1134). For Gulpayigan Friday mosque, see Korn 2015; <https://archnet.org/sites/3872> (Last Accessed: May 3, 2021). For Barsiyan Friday mosque, see Smith 1937; Godard and Smith 1937; <https://archnet.org/sites/5433> (Last Accessed: June 8, 2021).

⁹⁸⁵ The best and perhaps the only example of use of this stucco artistic technique is the Khwaja Atabak mausoleum in Kirman (1100-1150), on its external architectural surfaces. See Qasimi 2010, Vol. 12, 64-67; <https://archnet.org/sites/2894> (Last Accessed: May 3, 2021).

⁹⁸⁶ A good example is the top horizontal panel of the Small Ilkhanid stucco mihrab at the Isfahan Friday mosque (Cat. No. 1).

⁹⁸⁷ Such grills were documented on three stucco repertoires: the Uljaytu mihrab at the Isfahan Friday mosque (top horizontal panel, 1310; Cat. No. 1), two cases at the Pir-i Bakran mausoleum (third decorative stage: 1312-1313, Cat. No. 2) and the Urumiya Friday mosque mihrab (Cat. No. 23).

⁹⁸⁸ Such technique is best visible on related stuccos of the Haftshuya Friday mosque (the mihrab, c. 1310-1316; Cat. No. 3) and the Pir-i Bakran mausoleum stuccos (third decorative stage, 1312-13; Cat. No. 2).

⁹⁸⁹ The best example is presented by the stuccos of the monumental lunette of the Tabriz Friday mosque mihrab (Cat. No. 24).

⁹⁹⁰ See the above discussion.

⁹⁹¹ For stucco production technology in Islamic Spain which enabled partial prefabrication and mass production and was similar to Maghribi stucco production technology, see Rubio Domene 2010.

disappeared.⁹⁹² Round scripts such as *Thuluth* and *Naskh* became more prominent for monumental inscription bands of stucco repertoires. A Seljuq technique for production of stucco plugs, which could also be employed to form monumental *Khatt-i banna'i* inscriptions was employed more frequently: instead of producing carved or stamped plugs inserted between fired bricks of supporting walls; it required the plugs to be incised into a layer of stucco which entirely covered the walls.⁹⁹³ This technique was particularly suitable for monument redecorations which were frequent in Ilkhanid times.⁹⁹⁴ These developments had a continuation in subsequent periods, when cursive inscription styles and Square Kufic gradually became the most widespread inscription styles of the Timurid and Safavid periods.

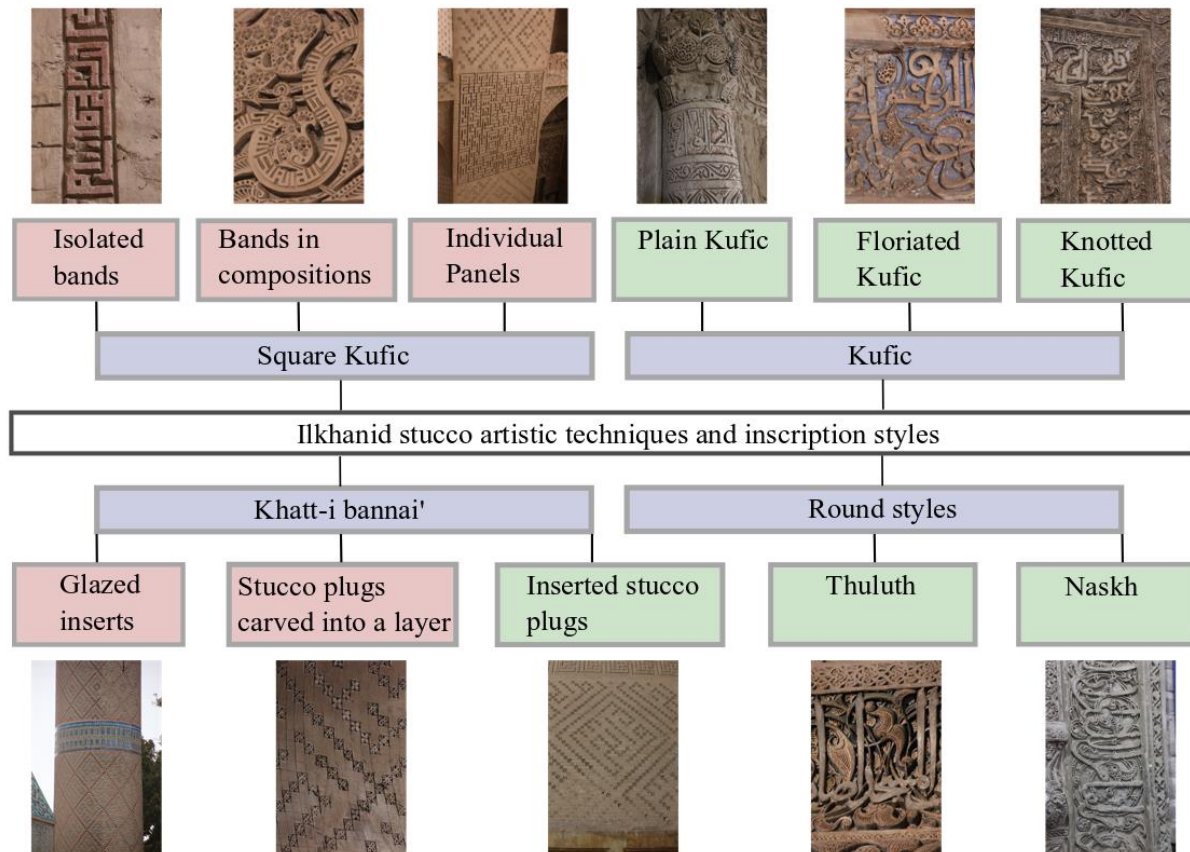


Figure 96: Taxonomy of the most frequently employed styles of inscriptions in stucco medium in the Ilkhanid period. Inscription styles marked with red are frequently employed in Ilkhanid period.

Further developments concern the practice of stucco perforation, which the enjoyed a wide spectrum of perforation types and became widespread. Perforation forms were determined by the tools the craftsmen had available for stucco production and by their carving skills. Moreover, compared to earlier periods, the frequency of signatures of stucco craftsmen's workshops increased in an unprecedented manner, as around 40% of Ilkhanid stucco repertoires

⁹⁹² Documentation of Ilkhanid stuccos presented in this research did not reveal a case where Floriated Kufic was employed in its characteristic form.

⁹⁹³ There is a limited number of cases of this technique being used in the Seljuq period. One of the examples is presented by the monumental repertoire at the Ribat-i Sharaf caravanserai (rebuilt and redecorated in 1154-1155). See Kiyani 1981; <https://archnet.org/sites/3873> (Last Accessed: Mary 3, 2021). But this technique became particularly frequently employed in the Ilkhanid times.

⁹⁹⁴ As demonstrated in this research around half of the stucco repertoires are works of redecoration interventions, rather than revetments of newly built monuments. See Chapter 5; Section 5.2.

are signed by their master stucco craftsmen.⁹⁹⁵ The frequency and prominent forms and locations of these signatures likely reflect the advancement of the social status of stucco craftsmen and the significance of their art. As mentioned, signatures of craftsmen and master builders became of more extensive dimensions in the Timurid and Safavid periods; the trend thus continued.

Stucco colouring was one of the essential passages in the production procedure of carved stuccos. Numerous Ilkhanid stucco repertoires conserve polychromy remains, indicating that the majority of employed stucco colouring principles on Ilkhanid stuccos were inherited from earlier periods.⁹⁹⁶ Pigments employed for colouring the Ilkhanid stuccos however differ in their material characteristics. Extant published archaeometric research of Islamic stucco pigments indicates that in Ilkhanid times, the selection of pigments for the stucco colouring palette was more restricted, compared to earlier periods.⁹⁹⁷ This might be the result of a long period of experimentation and practice, trial and error, and of colour use by generations of stucco artists. Another specific development of the Ilkhanid period, tied to polychromy, is the occasional appearance of gold leaf gilding on carved and applied moulded and stencilled stuccos. It might reflect the practice of tile gilding which also developed in the Ilkhanid period. In addition to stuccos and wall paintings, the Ilkhanid period witnessed a proliferation of use of glazed and terracotta element compositions, moulded and glazed tiles, Lajvardina tiles and lustre tiles, for monument decoration. This frequent use of glazed tile medium in the Ilkhanid era developed further in the Timurid period, when glazed revetments, especially tile mosaic, almost entirely substituted stuccos. Only in the Safavid and Qajar periods, was the art of carved stucco revived, but with entirely different production technology and aesthetics. The polychromy spectrum of stucco widened again in the Safavid and Qajar periods, when the number of employed shades and pigments was considerably more extensive.⁹⁹⁸

b.) Stucco Production Technology and its Relation to Aesthetics of Carved Ilkhanid Stuccos

One of the main premises of this research is that the modality of stucco production and the material characteristics of stuccos determined the limits of producing the stuccos' diverse visual appearances (see Chapter 3; Section 3.1; Chapter 5; Section 5.1). It has been noted that the Ilkhanid stucco craftsmen inherited the stucco production approaches and artistic techniques from their predecessors, but that they also invented new artistic techniques and perhaps they also improved the technology of stucco production. The analysis of stucco artistic techniques for the earlier proposed taxonomy illustrates that different workshops employed separate artistic techniques and that workshops functioned as repositories of production knowledge by which they could also be distinguished from one another. Moreover, the invention of new stucco production approaches and artistic techniques only occurred over a longer chronological span, which reached beyond the pre- and post-Ilkhanid periods. In the Ilkhanid period, diverse artistic techniques were employed for creating carved stuccos, which ranged from the oldest ones, such as carving of stuccos out of one layer of fine stucco body, to those which may be inventions of the Ilkhanid period, such as application of constructed protruding elements. Techniques such as stucco undercut and application of protruding elements on one or more layers of carved

⁹⁹⁵ For a detailed discussion of Ilkhanid stucco craftsmen's signatures, see Chapter 3; Section 3.2.

⁹⁹⁶ For a detailed discussion of Ilkhanid stucco polychromy, see Chapter 4; Section 4.2.

⁹⁹⁷ Parviz Holakoei, paper presented at the *I Love Persian Stucco, Lectures and Practical Workshop* conference, University of Bamberg, April 10-12, 2018.

⁹⁹⁸ *Ibid.*

stucco, and carving of stucco out of more than one layer of fine stucco were some of the most frequently employed artistic techniques in the Ilkhanid period.

Yet, there is no exact chronology of their use or major or lesser frequency of them being employed in the evolutionary sense. Rather, all techniques were employed at once, contemporaneously, although each workshop worked with the techniques they knew.⁹⁹⁹ Some specific features of Ilkhanid stuccos can be observed in this respect. Techniques which comprised carving of more than one layer of fine stucco material were employed more frequently. Moreover, stucco undercut and application of different types of protruding stucco elements were also used very frequently by stucco craftsmen. Consequently, compared to pre-Ilkhanid stuccos, especially those of the Seljuq period, the total dimensions and depth of Ilkhanid stucco relief became increasingly deeper (and thicker), and characterised by deep carving and numerous protruding elements, especially on stucco panels without inscription bands. This development was conditioned by the possibility of working the stucco body in specific manners, and it might have been the result of the use of *killed plaster*, as suggested by Mishmastnehi in his preliminary research results.¹⁰⁰⁰ In sum, this technical innovation might have determined new developments of stucco artistic techniques and it may have also impacted the visual appearance of Ilkhanid stucco reliefs.

Some of these artistic inventions might have been already in use in the late Seljuq period and some Seljuq stucco repertoires, for example the stuccos of Madrasa Haydariyya in Qazvin (1119)¹⁰⁰¹ or the Gunbad-i 'Alawiyan stuccos in Hamadan (1150-1200?),¹⁰⁰² visually resemble Ilkhanid stuccos. Another related case is the mihrab of the Pir-i Hamza Sabzpush mausoleum in Abarquh, which carries the fragmented date of the second half of the twelfth century;¹⁰⁰³ it is a prelude to the typically Ilkhanid practice of producing stuccos with undercut and applied protruding elements. These stucco programmes (and others) were sometimes believed to be of Ilkhanid date and not Seljuq, due to their stylistic similarity to Ilkhanid stuccos, but these stucco repertoires should rather be understood as precursors of new stucco production practices.

In addition to the listed established artistic practices, the visual form of the design of Ilkhanid stuccos does not differ markedly from Seljuq stuccos, although more differences can be spotted when Ilkhanid stuccos are compared to Early Islamic repertoires. Looking at mihrabs, the design of Seljuq mihrabs does not differ noticeably from Ilkhanid mihrabs, except for their proportions. In both periods, mihrabs were designed to feature a central niche, which could be occasionally framed by one or two arches supported by columns and framed on three sides by several inscription and vegetal composition bands. For other types of stucco panels, most types and forms were already fully developed in the Seljuq period. Visual devices, such as inscription bands running along interior surfaces of *iwan* structures (especially *qibla iwans*) were widespread in Seljuq times. Moreover, ceilings of *iwans* were occasionally coated with large

⁹⁹⁹ This is also likely for the pre-Ilkhanid stuccos, but further research needs to be performed to provide evidence in support of this hypothesis.

¹⁰⁰⁰ Moslem Mishmastnehi, personal communication to the author.

¹⁰⁰¹ See Pope and Ackermann 1977[1938-39], Vol. 3, 1020-1021; <https://archnet.org/sites/3865> (Last Accessed: Mary 3, 2021).

¹⁰⁰² See Shani 1996; <https://archnet.org/sites/1610> (Last Accessed: Mary 3, 2021).

¹⁰⁰³ See Karimiy and Holakoei 2015.

panels of carved stucco of diverse visual forms, in Seljuq period. Such types of stucco revetments continued to be in use in Ilkhanid times. But during the Ilkhanid period, the repertoires normally became to comprise larger numbers of stucco revetment panels which covered more extensive architectural surfaces.¹⁰⁰⁴

Ilkhanid stucco repertoires have traditionally been understood as more chaotic and haphazard assemblages of panels, compared to presumably more sober, balanced and organized stucco repertoires of the Seljuq period. This research indicates that such a perception of the stuccos of these two periods is erroneous. One of the main differences between the stuccos of these two periods is the considerably higher frequency monument redecorations with stucco in the Ilkhanid period. Furthermore, in numerous cases, stucco repertoires of the Ilkhanid era were formed by more than one decorative intervention; perhaps the best examples are the architectural repertoires of the Pir-i Bakran mausoleum (Cat. No. 2) and the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), which were produced in three and two decorative undertakings. The perceived chaotic and exuberant appearance of Ilkhanid stuccos is thus not justified; it most frequently stems from the lack of understanding of the chronology of the Ilkhanid stucco repertoires production.

c.) Principles of Ilkhanid Stucco Revetment Decoration

A closer look at Ilkhanid programmes of architectural revetments illustrates that they were produced according to logic and principles which were already in frequent use in the Seljuq period. For both historic periods, a set of basic principles of use of stuccos and other revetments can be discerned. Among these, the most frequent principles of use of stuccos comprise: highlighting of the essential architectural spaces of monuments (such as the main domed prayer hall, the *qibla* wall, the *qibla iwan* or the entrance portal), to bolster appearance and significance of graves of revered personages and their immediate proximities, to determine function of architectural spaces for religious rites and to visually lead the spectators towards the most significant parts of monuments. Function of stuccos and other revetments accordingly determined their frequently uneven distribution across architectural surfaces, with a concentration in *qibla* areas, funerary spaces and entrance portals. With their visual appearance consisting of epigraphic, geometric and vegetal elements arranged into compositions, the stuccos highlighted the significance of specific architectural surfaces and parts of the monuments. This was further highlighted in their inscriptions (historic and religious) which expressed a more detailed and a more explicit statement reflecting the function of the monuments and significance of their patronage and production.

In sum, rather than being a result of a haphazard application, there existed a clear logic and set of principles for the production of stuccos and their distribution within the monuments, which determined the formation of the entire decorative programmes, in both the Seljuq and Ilkhanid periods. The significance of revetments and the message and meaning which were explicitly expressed in epigraphic programmes of stuccos are confirmed by redecoration interventions. Redecorations frequently determined the transformation of significance and function of the

¹⁰⁰⁴ But a few such cases have also been documented for the Seljuq period (e. g. Ribat-i Sharaf, Gunbad-i 'Alawiyan).

monuments or their parts. Such activities were partially connected to the question of the official state religion, fostering of pilgrimage and the need for the urban development of settlements. The research succeeded in proving that these redecoration interventions were rarely motivated by the needs for repairs of earlier revetment programmes (see Chapter 5; Section 5.2). Rather, most redecorations were sponsored by patrons to highlight their political alliance with the state apparatus and the rulers, by the means of pious patronage. These principles for production and placement of Ilkhanid stucco revetments are thus not unique; rather, they are closer to the principles of decoration of the pre-Ilkhanid and post-Ilkhanid periods, which have so far not been acknowledged.

6.2 Some Considerations Concerning Ilkhanid Stucco Style

a.) Towards the Comprehension of Ilkhanid Stucco Style

The research has shown that the stuccos of the Ilkhanid period display distinct characteristics of their production approach, employed stucco artistic techniques, features of their reliefs, styles of inscriptions, and geometric and vegetal elements. A closer look at Ilkhanid stucco repertoires, their geographical locations and relation to other programmes, allowed these stuccos to be grouped according to the workshops which produced them, by drawing on their technological and aesthetic characteristics. The research in chapter 4 (see Chapter 4; Section 4.4) discusses manners in which the stucco workshops functioned and the characteristics of their short and long-distance mobility. It is shown that it would be erroneous to comprehend these stuccos as works of regional schools, but that rather, that there was long and short-distance mobility. Moreover, stucco workshops determined the geographical spread of different techniques for stucco production, stucco designs and their visual features, by the means of their mobility for commissions. Rather than one uniform style, there existed a multitude of Ilkhanid styles, which were determined by the workshops themselves and their mobility. To define one, or *the*, Ilkhanid stucco style, would mean to over-generalize and to ignore substantial differences between these stucco repertoires. Nevertheless, two approaches can be adopted in an attempt to propose what is typical of Ilkhanid stuccos: the first approach comprises the juxtaposition of Ilkhanid stuccos to the Seljuq and Timurid stuccos - therefore their chronological contextualization, and the second approach consists of identifying what is the most distinctive Ilkhanid stuccos are, by concentrating on observations of inventions of stucco art which were most frequently employed in the Ilkhanid period.

Ilkhanid Stucco Style and its Chronological Context

The most frequently employed stucco artistic techniques in the Seljuq period were: carving of stuccos out of one stucco layer, carving of stuccos out of more than one stucco layer, stucco perforation, application of circular elements, and combinations of these artistic techniques. Stucco undercut was employed on a small number of repertoires (the Haydariyya madrasa in Qazvin, the Malik mosque in Kirman,¹⁰⁰⁵ the Gunbad-i 'Alawiyan in Hamadan), but its use was more frequent in Ilkhanid times. In the Seljuq period, specific revetments, mainly backgrounds of repertoires, were also produced by combining brick or terracotta material with carved stucco

¹⁰⁰⁵ See Anisi 2004; https://archnet.org/sites/1632/media_contents/41570 (Last Accessed: May 4, 2021).

(e.g. the Barsiyan Friday mosque, the Gulpayigan Friday mosque); this technique died out and it was not used by Ilkhanid craftsmen.¹⁰⁰⁶ A specific Seljuq case is presented also by the Khwaja Atabak mausoleum¹⁰⁰⁷ stuccos in Kirman, which features re-used glazed sherds incorporated in carved stucco panels; this technique has no parallels. Ilkhanid stuccos feature frequent stucco undercut, occasional pseudo-undercut stucco, extensive application of diverse protruding elements, occasional constructed protruding elements and even shallow appliqué elements. In a small number of cases, these stucco repertoires even comprise perforated grills. These artistic techniques thus aided the Ilkhanid craftsmen to produce a characteristically Ilkhanid deeply carved stucco relief, which was also characterized by numerous protrusions of diverse visual forms.

The stucco revetment design production process did not change substantially between the Seljuq and Ilkhanid periods. Most schemes and forms which were employed by the Ilkhanid craftsmen (for mihrabs, and stucco panels) already existed in Seljuq times. Proportions however changed slightly, with Ilkhanid works putting generally a greater emphasis on the vertical axes of mihrabs and other revetments. Another difference comprises dimensions and characteristics of stucco repertoires. These became generally more extensive in the Ilkhanid period, because they comprised a large number of stucco panels and inscription bands, compared to the majority of Seljuq repertoires. Nevertheless, there are some exceptions of monumental repertoires of the Seljuq period, such as the stucco programme produced during the renovation of the Ribat-i Sharaf caravanserai in Khurasan region.¹⁰⁰⁸ These stuccos were more often combined with revetments in other media (lustre tiles, glazed tiles, applied moulded and stencilled stuccos and wall paintings), compared to the carved stuccos of the Seljuq period, which mainly functioned as independent decorative programmes in one medium.¹⁰⁰⁹

This research revealed further differences between Seljuq and Ilkhanid stuccos, which regard the practice of signing the repertoires and their colouring. Only three signatures have been documented on the stucco repertoires pre-dating the Ilkhanid period: the small carved stucco mihrab of the Zuzan complex (11-12th century), the stuccos of the Ardistan Friday mosque (second half of 12th century)¹⁰¹⁰ and the monumental mihrab of the Pir-i Hamza Sabzpush mausoleum in Abarquh (second half of 12th century). Compared to these, the Ilkhanid repertoires were signed with far greater frequency, as some 40% of repertoires retain signatures of their master stucco craftsmen (a total of twenty-eight signatures have been documented; see Chapter 4; Section 4.2). It is interesting to note that other Ilkhanid revetments, such as lustre tiles and woodwork were also frequently signed, but in the wall painting medium signatures occur seldom and the repertoires of applied moulded and stencilled stuccos seem not to have been signed at all.¹⁰¹¹ It seems that for every medium of revetments, produced by specialized

¹⁰⁰⁶ For Gulpayigan Friday mosque, see Korn 2015; <https://archnet.org/sites/3872> (Last Accessed: May 3, 2021). For Bersiyan Friday mosque, see Smith 1937; Godard and Smith 1937; <https://archnet.org/sites/5433> (Last Accessed: June 8, 2021).

¹⁰⁰⁷ See Qasimi 2010, Vol. 12, 64-67; <https://archnet.org/sites/2894> (Last Accessed: May 3, 2021).

¹⁰⁰⁸ Kiyani 1981; <https://archnet.org/sites/3873> (Last Accessed: April 15, 2021).

¹⁰⁰⁹ Lustre tiles were however already occasionally employed as architectural revetments in the Seljuq period.

¹⁰¹⁰ See Qasimi, 2004, Vol. 7, 32-41; <https://archnet.org/sites/2858> (Last Accessed: May 4, 2021).

¹⁰¹¹ The fact that applied moulded and stencilled stuccos seem not to have been signed could have something to do with the fact that these revetments were to a great extent pre-fabricated before they were applied on the architectural surfaces. For wall paintings, the scarcity of craftsmen's signatures is challenging to explain. One of

workshops, there existed distinct practices of claiming the authorship of repertoires. In the Aq Quyunlu and Timurid periods the practice of signing architectural revetment repertoires developed further; signatures of masters of tile mosaic production occur frequently and on even more prominent locations.¹⁰¹²

Discussion of Ilkhanid polychrome stucco, colouring practices and choice of colours and pigments, proposed in this research (see Chapter 3; Section 3.2) illustrates that there exist substantial differences in polychromy of Seljuq and Ilkhanid stuccos. These differences concern above all the choice of pigments for stucco colouring, but polychromy aesthetics and colouring principles are related to each other. In fact, the logic behind the Ilkhanid stucco colouring stems from a long-standing tradition. The Zuzan mihrab (11-12th centuries) and the mihrab of the Pir-i Hamza Sabzpush mausoleum (second half of 12th century) are two stucco repertoires of earlier periods, which conserve exceptional amounts of polychrome stucco. Observations of these works demonstrate that they were coloured according to a logic which was later employed by the Ilkhanid craftsmen and may have remained almost entirely unaltered.

Moreover, in the Ilkhanid period, gilding of stuccos may have occurred for the first time. Wall paintings of earlier dates (Isfahan Friday mosque and Tabriz Friday mosque) are known to have been gilded,¹⁰¹³ but not stuccos. This is perhaps the best discernible difference in stucco polychromy between the Ilkhanid and earlier periods. At least four repertoires (the Sultaniyya mausoleum, the Rukniyya complex, the Uljaytu mihrab in the Isfahan Friday mosque and the second decorative phase at the Pir-i Bakran mausoleum; Cat. Nos. 27, 29, 1, 2) of the Ilkhanid period, two of which comprise carved stuccos, retain extensive remains of gold leaf gilding, which might have been a prerogative of more important commissions for architectural repertoires. The addition of gilding widened the colour spectrum for polychrome stucco, but it also required specific technology to cover extensive stucco surfaces with gold, silver or tin leaf. This major invention of the Ilkhanid period could have been impacted by similar practices in tile revetment production, such as the Seljuq Mina'i technique or Ilkhanid Lajvardina.

Differences between the Seljuq and Ilkhanid stuccos are also discernible in the use of inscription styles and geometric and abstracted vegetal elements. In the Seljuq period, prevailing inscription styles of stucco repertoires comprised extensive use of Kufic styles (Floriated, Knotted, or Plain Kufic) and fairly frequent use of cursive styles such as *Naskh* and occasionally *Thuluth*. *Khatt-i Banna'i* was also employed for the backgrounds of decorative programmes and sometimes Square Kufic could also be documented. The frequency in use of these inscription styles changed considerably in Ilkhanid period. These stuccos are characterized by the prevalence of cursive styles over angular styles. *Naskh* and *Thuluth* are employed very frequently, and they are occasionally juxtaposed with Plain or Knotted Kufic, but Floriated Kufic seems to have been in use only exceptionally. Differently to the Seljuq period, Ilkhanid stuccos feature extensive use of the Square Kufic style (for independent panels and bands and

the few signatures has been documented on the wall paintings of the Farasha Qadamqah (c. 1300), but their dating would need to be ascertained. Absence of signatures in these decorative media could also simply reflect different craftsmen's practices.

¹⁰¹² From the personal database of the author.

¹⁰¹³ Jung 2016; Lorenz Korn, What were the earliest dome chambers in Iranian mosques? An Archaeological Perspective, paper presented at the 12th ICAANE, University of Bologna, April 6-9, 2021.

as part of vegetal compositions), which must be considered characteristic of the Ilkhanid stucco style. Moreover, the *Khatt-i Banna`i* inscriptions also became more frequent and were produced with a wider variety of stucco artistic techniques (inserted carved stucco plugs, glazed elements and plugs carved into a layer of stucco).

Some differences can be spotted between visual elements of the Seljuq and Ilkhanid repertoires. Most visual elements of the Ilkhanid stuccos, listed above, such as palmettes, half-palmettes, floral scrolls, abstracted blossoms and others, stem from the long-standing tradition of stucco and architectural revetment iconography which began to be developed in the Early Islamic period. Moreover, some of the visual elements, such as the pearl border, may originate from Sassanid times. The most frequent, but not the only visual elements employed for non-epigraphic compositions, or for the background of inscriptions, were symmetrical compositions of palmette-derived elements and floral scrolls. This was also the case in the Seljuq period, but the general difference between stuccos of the two dynasties is the level of attention to detail. Ilkhanid stucco compositions show a greater attention to detail and to stucco carving.¹⁰¹⁴

The examination of the differences between Seljuq and Ilkhanid stuccos illustrates numerous divergences between these repertoires from aesthetic and technological points of view. These differences are the results of the development of stucco art, which occurred through a number of generations, and which was impacted by large-scale commissions, fostering of patronage on monuments and by technological inventions for the production of stuccos. The trend continued in the post-Ilkhanid period in several directions. Research of stuccos in the region of Qum (Cat. No. 15) illustrates that the practice of producing stucco revetments in this restricted geographical unit continued almost uninterruptedly after the dissolution of the Ilkhanid Empire all the way until the end of the fourteenth century, without any substantial changes. Similar occurred in the area of the Muzaffarid territory, with the capital of Yazd, where applied moulded and stencilled stuccos were produced not only under Ilkhanid rule, but also in the decades following its dissolution (Cat. No. 29). Developments were less uniform in other geographical regions, but the general trend is a gradual cessation in the use of carved stucco medium and its replacement with glazed revetments produced with differing artistic techniques. Similar occurred in the neighbouring lands of Iran and Central Asia, where glazed revetments were increasingly employed in place of wall paintings or stuccos.¹⁰¹⁵ On the other hand, stuccos produced with specific technology continued on in Maghreb and Andalusia.¹⁰¹⁶

Ilkhanid Stucco Style and its Distinctive Features

The examination of the stylistic characteristics of Ilkhanid stucco repertoires highlights the problem of the definition of the Ilkhanid stucco style. Diverse features of stucco repertoires scattered across the extensive territory reflect the multitude of different aesthetic styles of stuccoworks during the Ilkhanid period, which were produced parallel to each other, but by different craftsmen with differing stucco production knowledge and different traits of revetment design and visual features. It has also been demonstrated that division of these stucco repertoires and the claim that they could be works of different regional schools is counterproductive in

¹⁰¹⁴ This might be conditioned by the new possibilities of preparing and working the stucco body.

¹⁰¹⁵ See O’Kane 1978; Wilber and Golombek 1988; Aube 2017.

¹⁰¹⁶ See Rubio Domene 2010.

trying to understand their function, meaning and aesthetic principles. The chronological contextualization of the Ilkhanid stuccos, performed their comparison to earlier stuccoworks, allowed the differences between these works to be demonstrated and to propose an overview of specific characteristics of Ilkhanid stuccos. This overview is important in understanding the stuccos, but it does not entirely give justice to all the peculiarities of Ilkhanid stucco repertoires and the technological and visual devices which were invented in order to produce them. Accordingly, another approach to define the Ilkhanid stucco style is adopted here, with the aim to highlight the most specific aspects of Ilkhanid stuccoworks. It consists of a selected discussion of stucco repertoires and other aspects of the Ilkhanid architectural revetment programmes, which are considered to best illustrate the distinct characteristics of Ilkhanid stuccos, their technical features and aesthetic appearance.

Ilkhanid Inventiveness: Stuccos of Isfahan – the Ushturjan Friday Mosque, the Pir-i Bakran Mausoleum and the Haftshuya Friday mosque

Perhaps the most illustrative examples of the distinct features of Ilkhanid stuccos are the three stucco repertoires near Isfahan: the 1315-16 stuccos of the Ushturjan Friday mosque (Cat. No. 4), the second and the third decorative phase at the Pir-i Bakran mausoleum (1303-04; 1312-1313; Cat. No. 2) and the stuccos of the Haftshuya Friday mosque (c. 1310-1316; Cat. No. 3). The majority of these stucco repertoires were most likely works of one stucco craftsmen's workshop, which produced them within a timespan which slightly exceeds a decade. Drawing on the signature of the third decorative phase at Pir-i Bakran, this could have been the workshop of Muhammad Shah al-Naqqash. These repertoires retain most of the characteristics which have been judged specific to the Ilkhanid period.

These stuccos were produced with a wide selection of stucco artistic techniques, characteristic of which is that it frequently employed the practice of undercutting stucco relief which was produced out of several inclined layers of fine stucco body. Most surfaces of the non-epigraphic elements are heavily perforated with diverse types of perforations. Moreover, these repertoires frequently feature very deep reliefs, which are also extremely protruding and have been formed by the carving of several stucco layers, the addition of applied protruding elements of different forms and further undercutting of the stuccos. Perhaps the best examples are the two horizontal registers topping the mihrabs at Ushturjan and Pir-i Bakran. The mihrab of Haftshuya also retains numerous applied constructed hollow elements, which are characteristic of Ilkhanid stuccos.

Two out of three of these repertoires (Ushturjan and Pir-i Bakran) are characterized by the large dimensions of their decorative programmes which cover the majority of their architectural surfaces and consist of numerous panels and bands. All three stucco repertoires retain extensive traces of polychromy indicating that the colouring palette of the Ilkhanid stuccos could comprise: white, red, orange, pink, light blue, dark blue, green and perhaps black and occasionally gilding. Epigraphic programmes of these repertoires comprise distinct types of Kufic, especially Square Kufic, and *Naskh* and *Thuluth* inscription styles. Frequent use of Square Kufic in three diverse manners is particularly characteristic of this stucco style. Abstracted vegetal ornaments dominate over geometric patterns. Geometric elements are in fact limited to a small number of framing bands with repeating patterns. The presence of pearl

border outlines in these compositions reflects the long tradition of stucco art in the Iranian territory. The most dominant, but not the only, element of the non-epigraphic compositions of these stuccos are palmettes and half-palmettes of diverse forms; they are occasionally combined with abstracted blossom elements. Further significant visual elements of stuccos comprise entirely abstract forms of swirls and perhaps leaf-derived compositions. The deep carving of several stucco layers, application of protruding elements and stucco undercut were masterly employed to transform the visual appearance of these panels into extremely three-dimensional and dynamic compositions.

The characteristics of the three repertoires of stuccos in the Isfahan area reflect the majority of the inventions and characteristics of Ilkhanid stuccos. These elements are also found in the majority of other Ilkhanid stuccos, but there, they are combined in a different manner and perhaps not all of them at the same time. These three repertoires are works of the same stucco workshop and they were produced in a short time span, but they feature stucco production knowledge, artistic techniques and aesthetics which spread across the territory of the Ilkhanid Empire over a longer time period through the mobility of this stucco craftsman's workshop. Nevertheless, Isfahan could perhaps be considered as one of the main centres of stucco production in the Ilkhanid period, together with Bistam, Natanz, Kashan, Abarquh, Yazd, Sultaniyya, Varamin and Tabriz. The described disparity in the appearance of Ilkhanid stuccos is different, compared to the greater aesthetic uniformity of stuccoworks in Maghreb and Andalusia, which was determined by their more standardized production technology.¹⁰¹⁷ Quite to the contrary, similar disparity in appearance of stuccos has been observed on stuccos of Mamluk Egypt; this was likely caused by the similarity in the system of their production and design, which are closer to the Iranian stuccos than those of Maghreb and Andalusia.¹⁰¹⁸

Isolated Creativity? The Tabriz Friday Mosque Mihrab

Fig. 28.

The Tabriz Friday mosque carved stucco mihrab survives in fragments. Recent restoration interventions, partially erroneous, do not give justice to the superbly designed and carved stucco panels forming this monumental mihrab. It does not retain a craftsmen's workshop signature nor the date of its completion. It is likely the work of Ilkhanid repairs to the monument, which took place around 1300 - sometime after the devastating earthquake which hit the city in 1273. The monumental mihrab features diverse panels of epigraphic and non-epigraphic content, but the most interesting is its monumental lunette panel, which is preserved in unrestored fragments.

The mihrab's monumental lunette retains remains of a masterly produced stucco panel which can be partially related to stuccos of the Isfahan area. The panel is deeply carved and at the same time constructed by the application and carving of very thick layers of stuccos and of entirely constructed applied hollow elements. Undercutting of these elements is clearly visible. The panel consists of diverse and almost entirely abstracted forms of palmette elements, which are heavily perforated and outlined with Square Kufic bands with repeating invocations to God.

¹⁰¹⁷ See Rubio Domene 2010.

¹⁰¹⁸ See Korn 2003; O'Kane 2016.

Some applied elements are more modest and comprise swirls of vegetal scrolls and elements resembling blossoms. These elements were superimposed on each other, and they enabled the craftsmen to produce a very deep and extremely dynamic relief resembling the composition of abstracted floral blossoms with openings in their centres. These stuccos also retain extensive traces of green, red, white and blue.

This stucco panel summarizes the majority of visual elements of the Ilkhanid stucco compositions. Moreover, it was produced with stucco carving approaches and artistic techniques which were either invented or frequently employed in Ilkhanid times. But the final aspect of this panel is particularly striking due to its depth, abstraction and dynamic appearance and it does not have parallels to other stucco repertoires. The panel could either be comprehended as the result of a craftsmen's experimentation in the production of stuccos. If so, such experiments were of those which generated use and inventions of new artistic techniques and visual vocabulary of stuccos. Perhaps repertoires of the Seljuq period resembling the Ilkhanid stuccos (Gunbad-i 'Alawiyan, Madrasa Haydariyya and the Pir-i Hamza Sabzpush mausoleum) could also be comprehended as such experiments. Alternatively, stuccos of the Tabriz mihrab could also be the work of craftsmen from another region (Isfahan?), who arrived in Tabriz and produced the mihrab which consequently does not resemble any stuccos in the north-western Iranian region. The former, or combination of the former and the latter, are the most plausible explanations.

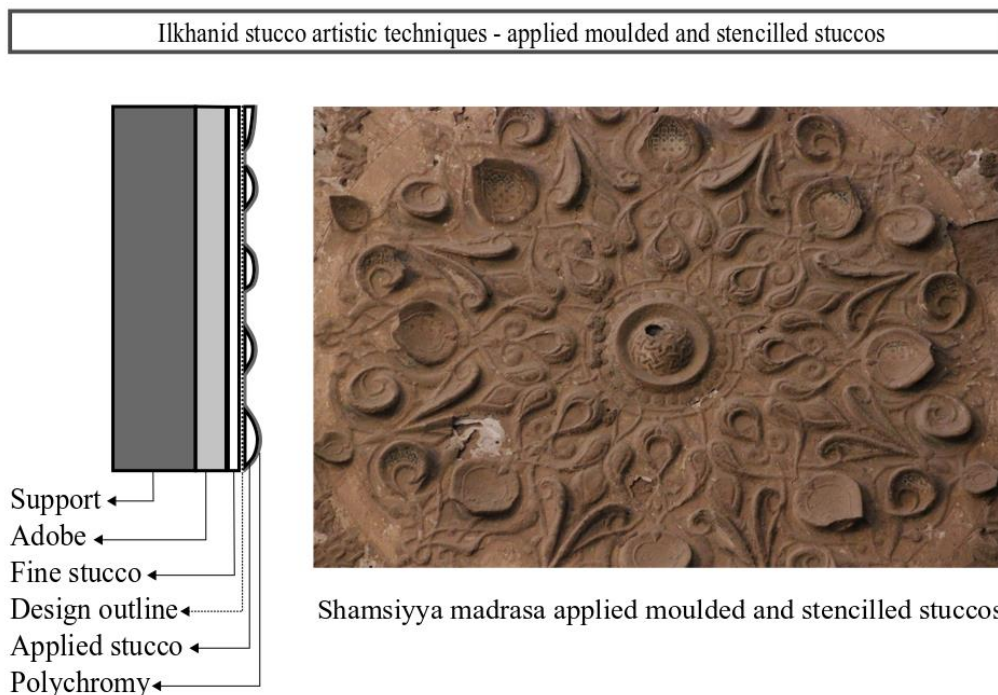


Figure 97: Schematic representation of artistic techniques of applied moulded and stencilled stuccos.

Separate Developments: the Uljaytu Mausoleum at Sultaniyya and Yazd Complexes (Rukniyya and Shamsiyya)

Fig. 97.

The discussion of the Ilkhanid architectural revetments and carved stucco techniques in chapter 3 (Section 3.1) demonstrates that separate developments of inventions of new artistic techniques for the production of architectural revetments, which do not belong to the class of carved stuccos, are found on several Ilkhanid monuments. Among these, the most important advancements comprise the invention of techniques for the production of applied moulded and applied stencilled stuccos.¹⁰¹⁹ These techniques did not involve stucco carving and their material composition, yet to be analysed in detail, is significantly different (in some repertoires these revetments comprise paper or textiles). Invention of these two artistic techniques enabled production of entirely distinct programmes of architectural revetments, compared to those in carved stucco or lustre tiles. Use of these artistic techniques signalled the invention of entirely new aesthetics of revetments, but in some aspects they were shared, because applied moulded stuccos, in some instances, may mimic visual characteristics of carved stuccos. Perhaps the best example is provided by the *shamsa* designs in the interior of the Shamsiyya complex (Cat. No. 29), which feature compositions consisting of bevelled and undercut-appearing protruding visual forms made out of paper and a mixture of gypsum or clay-derived materials. Differently to some occasionally occurring techniques, applied moulded and stencilled stuccos were employed on a large scale, and combined with the wall painting medium and also some carved stuccos.

The most monumental repertoire is presented by the second decorative phase of revetments in the octagonal core interior of the Uljaytu mausoleum at Sultaniyya (phase one: c. 1305-1310; phase two: c. 1313-1316/20; Cat. No. 27). Other significant repertoires are presented by the complexes of Rukniyya (1325) and Shamsiyya (c. 1335?) in Yazd (Cat. No. 29). These revetments are found on a smaller scale also in the Ushturjan Friday mosque (1315-16 or later; Cat. No. 4) and at the Pir-i Bakran mausoleum (third decorative phase 1312-13; Cat. No. 2). Geographical distribution of these repertoires is limited, indicating that they were produced by expert workshops who were mobile between Sultaniyya, Isfahan and Yazd. The known dates of these repertoires indicate that the craftsmen began their works in Sultaniyya, crossed to Isfahan and arrived for work in Yazd. It remains unclear whether the Sultaniyya project generated invention of these new techniques or if they already existed prior to the commission. In any case, the monumental repertoire at Sultaniyya must have transformed the knowledge of craftsmen and generated new expertise, which was subsequently employed in the areas of Isfahan and Yazd.

As suddenly as they appear, these techniques also disappear, because they do not seem to have continuation upon the completion of projects in Yazd. If so, the knowledge of production of such revetments must have been limited to a number of individuals and it was likely kept secret. These decorative repertoires and revetments are unique in terms of the chronological and geographical context of their production and they must be understood as one specific aspect of

¹⁰¹⁹ See Alvandiyani 2010; Alvandiyani 2012; Alvandiyani, Ulumi and Khademzade 2009; Hamzeli 2002.

Ilkhanid architecture and architectural revetment repertoires partially connected to the carved stucco medium.

Specific Traits: Lustre Tiles and Glazed Revetments of Ilkhanid Monuments

Fig. 98.

In addition to carved stuccos, wall paintings and applied moulded and stencilled stuccos, Ilkhanid architectural revetment repertoires frequently comprised revetments in lustre tile and glazed (sgraffito, tile mosaic, glazed and terracotta inserts, Lajvardina) media. Use of these media is not an Ilkhanid invention, and there are earlier monuments of the Seljuq period with revetments in most of the listed media.¹⁰²⁰ But during the Ilkhanid period, such architectural revetments were employed more frequently to decorate a greater number of monuments. Lustre tiles present specific problems, concerning their function and meaning, which require separate research. They often feature animate figures: fantastic creatures (dragon, phoenix) human figures (scenes from the *Shahnama*, princely cycle, etc.) and other animals (most frequently diverse types of birds). Reasons for the depiction of these figures, their meaning and function within secular and religious contexts still need to be clarified. The difference in use of lustre tiles, compared to other media with glazed revetments, is relatively well discernible. Lustre and Lajvardina tiles were luxury products, and they were accordingly employed as revetments on a reduced scale and to highlight focal points of the monument interiors. Other glazed revetments could be employed on a more extensive scale and for interiors or exteriors.

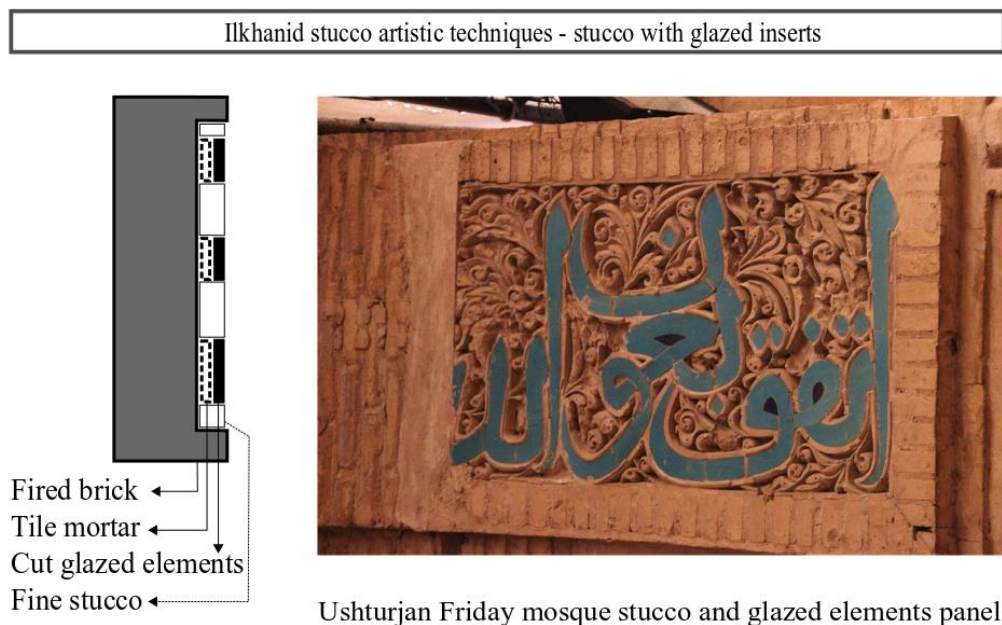


Figure 98: Further separate developments of Ilkhanid architectural revetment artistic techniques: combination of carved stucco and glazed elements.

¹⁰²⁰ One exception are Lajvardina (glazed and gilded) tiles, which are Ilkhanid invention.

Arguably, the most significant site which retained extensive programmes of lustre and other glazed revetments is the summer palace commissioned by Abaqa Khan around 1270, the Takhti Sulayman.¹⁰²¹ Archaeological excavations of the site led to the discovery of extensive amounts of revetments in lustre, Lajvardina, glazed, under and over-glazed, but there is only limited information concerning their original location within the secular complex and their function and meaning within it.¹⁰²² According to Masuya, these tiles with scenes from the *Shahnama*, magical creatures and animals should be understood as princely images, and thus as reflecting the function of the summer hunting palace.¹⁰²³ Research by Porter and Donabédian also demonstrates that the tiles from this site, and perhaps other Ilkhanid palatial complexes, soon became sources of tiles for their re-use in religious contexts.¹⁰²⁴ Nevertheless, the extensive number of religious monuments known to have retained lustre tiles with animate imagery points towards the fact that some of these monuments were decorated with lustre tiles from the outset. Separate research is necessary to clarify their meaning and function within these monuments.¹⁰²⁵

Other Ilkhanid glazed revetment artistic techniques comprise: sgraffito tiles, the combination of terracotta and glazed elements and tile mosaic. These revetments required a considerable amount of labour for their production, but the material (terracotta and glazed elements) was technologically less demanding and cheaper to produce, compared to lustre tiles. Moreover, these revetments were more resistant to weathering, compared to lustre tiles. They were accordingly mainly employed on exterior architectural surfaces. One exception is presented by the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), which displays the most monumental revetment programme (first decorative phase: c. 1305-1310), but which is above all located in the interior of the mausoleum's octagonal core. These revetments, which comprised tile mosaic, were likely produced by craftsmen from Tabriz. Upon completion of the first decorative phase at Sultaniyya, the craftsmen migrated in different directions for new commissions, and they produced the entrance portal revetments featuring strapwork at the Varamin Friday mosque (Cat. No. 28) and revetments of the Imamzada Shah Husayn at Varamin. These craftsmen also produced the entrance portal to the *khanqah* of the 'Abd al-Samad complex (Cat. No. 12) and the northern entrance portal of the Ushturjan Friday mosque (which is signed by the master builder and the tile cutter with the *nisba* Tabrizi; Cat. No. 4). In these cases, architectural glazed revetments were mainly employed for exterior architectural surfaces, especially entrance portals and also minarets. Some of these revetments, for example at the Varamin Friday mosque, are found in the interiors. Of these monuments, three have entrance portals with glazed revetments.¹⁰²⁶ Technology for the production of these revetments enables them to be employed on a large scale. Their frequent use on exterior architectural surfaces reflects the understanding of their resistance to the weathering agents. This is different from carved stuccos which were

¹⁰²¹ See Naumann and Naumann 1976; <https://archnet.org/sites/3882> (Last Accessed: May 4, 2021).

¹⁰²² See, for example: Masuya 1997; Masuya 2019.

¹⁰²³ *Ibid.*

¹⁰²⁴ Donabédian and Porter 2017.

¹⁰²⁵ At the time of the writing of this research work, a PhD research dedicated to lustre tiles in Ilkhanid religious monuments was being written by Anais Leone, at the Aix-en Marseille University in France. It was not possible to consult the work.

¹⁰²⁶ This might be indirect evidence which additionally indicates that they are works of the same craftsmen, who seem to have been well versed in the art of building (?) and decorating the entrance portals and minarets.

only exceptionally employed on exterior architectural surfaces (for example for the Seljuq mausoleum of Gunbad-i 'Alawiyan in Hamadan or for the Pir-i Bakran mausoleum near Isfahan; Cat. No. 2). These revetments are rarely directly juxtaposed or combined with carved stuccos. They however decorate monuments which also retain carved stucco revetments.

In sum, use of lustre tiles and different types of glazed and terracotta revetments began in Seljuq times and became considerably more frequent during the Ilkhanid period. In Ilkhanid monuments, these revetments were employed more frequently, on a larger scale and in combination with other revetments. Their main function was to accentuate the most important exterior architectural surfaces, and occasionally, they were employed to form parts of interior revetment repertoires. This is one of the specific characteristics of the Ilkhanid architectural revetment repertoires, which developed further in the Aq Quyunlu and Timurid periods, when tile mosaic and other artistic techniques for the production of glazed revetments were employed to form decorative programmes of monuments, and in which stuccos occurred only occasionally.¹⁰²⁷

b.) Ilkhanid Stuccos and Inventions of New Aesthetics

This examination of Ilkhanid architectural structures and their construction technology provides evidence that they were above all taken over from the pre-Ilkhanid builders. Technology for monument construction and building materials for Ilkhanid monuments were thus not new inventions, because they stemmed from and built on architectural technology of the Seljuq period. If so, then the monument architectural structures did not require new developments for the production of stuccos or other architectural revetment media. In most cases, the revetment production decisions were largely determined by the availability of working force and expertise. It has also been illustrated how every stucco craftsmen's workshop possessed their own technology of stucco production, designs, inscription repertoires and repertoires of visual elements. Due to the lack of interaction of these workshops, the bulk of knowledge and skills determined the characteristics of the works of every workshop and the final products – stucco repertoires.

If so, what was then the determining factor of inventions of new stucco artistic techniques and revetment media? Three possible hypotheses can be put forward in this respect. Firstly, it is likely that the reasons for many inventions were simply pragmatic. The aim was to produce as good as possible revetments and to optimize their production (to save resources, time and labour), so the craftsmen themselves could have striven towards practices which eased their work. Secondly, some inventions could have been the results of competition between craftsmen, for which however little evidence can be put forward. Craftsmen's workshops could work on monumental and also on small dimension projects, and there was no difference in the quality of the products between these types of commissions. Nevertheless, craftsmen needed to be summoned and hired for every commission. If so and having seen that an extensive number of workshops operated in Ilkhanid period, it is possible that craftsmen themselves strived for quality products in order to increase their chances of being chosen for the forthcoming commissions. Thirdly, one of perhaps the most important factors in determining new

¹⁰²⁷ See Aube 2017; O'Kane 1978.

technological and aesthetic inventions, were most likely large scale or imperial commissions. The research of the Uljaytu mausoleum at Sultaniyya (Cat. No. 27), and of monuments with related revetments (in glazed and applied moulded and stencilled stucco media), demonstrates that the project likely determined invention or further technological developments of an entirely new architectural revetment medium produced with distinct artistic techniques and featuring distinct aesthetics. Moreover, such projects, as mentioned on several occasions, functioned as generators of new technology and as transformative experiences for all the craftsmen and builders summoned to these sites. Upon completion of projects the newly generated knowledge of technology and new forms of aesthetic expression spread across the territory of the Empire and beyond, on account of the craftsmen's and builders' mobility.¹⁰²⁸

c.) Ilkhanid Stucco Style: Result of Linear Evolution or Specific Inventions? The Role of the Mongol Conquest of the Iranian Territory for Formation of Ilkhanid Stucco Style

This research demonstrates that the majority of the technology and approaches necessary for production of Ilkhanid stuccos stem directly from their predecessors – stuccos of the Seljuq period. Nevertheless, there are substantial differences between the stuccos of these two dynastic periods: some artistic techniques of the Seljuq period did not survive into Ilkhanid times and they were substituted with new technological inventions which conditioned development of distinctively Ilkhanid stucco style(s). But, *how do the proposed findings of the research relate to the scholarly understanding of the role of the Mongol conquest of the Iranian territory in regards to the development of stucco artistic style and technology and to the other architectural revetment media?* Two main conclusions can be drawn in this respect: that the Mongol conquest did not cause an absolute break and the annihilation of the arts of the past, and that the newly established political unit (the Ilkhanid Empire) formed a suitable climate and a new class of patrons of monuments, who fostered new developments in the sectors of monument construction and decoration through commissions themselves.

The fact that there was no substantial break in the production of Seljuq and Ilkhanid stuccos is best demonstrated by the evidence provided by the stucco repertoires. Observations of production technology and stucco artistic techniques propose an extensive amount of evidence indicating that Ilkhanid stucco production was based on that of its predecessors – craftsmen who produced stuccos under the Seljuq dynasty. Examination of available evidence concerning systems of transmission of architectural and stucco knowledge also demonstrates that the art of stucco was passed on between generations of craftsmen, often within family circles. The specificity of the artistic medium, the necessary skills for its production, thus had to be apprehended through apprenticeship (participation in a stucco workshop) and could not be learnt in any different way (from observations or by consulting a manual). There was thus never a substantial break of production of stuccos as caused by the Mongol invasion. The perceived break is caused by the lack of monuments dating to the Proto Ilkhanid (1227-1256) and Early Ilkhanid (1256-1295) periods, but as the primary written sources indicate (see Chapter 1; Section 1.2), numerous monuments built in this chronological context were not preserved to the present times. A considerable number of monuments also presents problems of dating and have been dated by scholars to the period in which it is known that monuments were being built,

¹⁰²⁸ See Korn 2003.

rather than periods considered at a standstill, due to the consequences of the Mongol invasion.¹⁰²⁹ Accordingly, it is possible to conclude that the break in art production caused by the Mongol Invasion is erroneous and results from a lack of evidence and hypotheses which require revision. Similar should be proposed for Timur's conquest of the Iranian lands; many frequently employed architectural revetment media, as shown in this research, began to be developed in the Ilkhanid period and reached their apex under Timurid patrons.

In fact, rather than a destructive event or force, the Mongol invasion should perhaps be perceived as a positive catalyst for architectural and artistic activities which followed in the Ilkhanid period. The Mongol invasion put an end to the rule of local dynasties in the period when the existence of the Great Seljuq Empire was almost entirely nominal. In doing so, it determined the formation of the new political unit – the Ilkhanid Empire. This political formation took over the existing public infrastructure and upgraded it for the needs of its population. This research has in fact demonstrated that in the formative period of the Ilkhanid Empire, more monuments were modified, repaired and redecorated than built anew. Only later, from the Golden Ilkhanid period onward (1295-1316), did the patronage of new constructions of monuments increase. The formation of this new political unit and accumulation of wealth within it gave way to the formation of a new class of patron of monuments. These were above all Ilkhanid officials, occasionally also Ilkhanid ministers and the rulers themselves. The new social class of patrons and the finances available were the preconditions and determining factors for construction and decoration of monuments as splendid as the 1270 summer palace of Takht-i Sulayman or the mausoleum of Uljaytu at Sultaniyya (Cat. No. 27). Moreover, as mentioned on several occasions, such large-scale projects impacted the mobility of craftsmen, circulation of building and artistic knowledge, and they fostered new inventions (new artistic techniques and new architectural solutions). In doing so, they determined the characteristics of the Ilkhanid stucco style(s), aesthetics, function and meaning of Ilkhanid stuccos and their role within the multimedia architectural revetment programmes of monuments.

6.3 Function and Meaning of Ilkhanid Stuccos

The purpose of this section of the research is to provide conclusive remarks answering the question: *what were function and meaning of Ilkhanid stucco revetments within their architectural contexts?* The section draws together the research findings and proposes information regarding the discerned patterns concerning the function and meaning of carved stuccos of the Ilkhanid period. It proposes observations regarding the occurrence of stuccos in different types of monuments and their relationship to the monuments' focal points and sacred loci. It attempts to understand what the presence of stuccos in these monuments means and mark and what the reasons behind their patronage were. It also provides information concerning the meaning and function of stuccos, which is based on the research of their epigraphic repertoires. Finally, the section closes by debating differences and convergent characteristics of stuccos and architectural revetments in other decorative media.

¹⁰²⁹ Further information in support of this statement is provided by the evident continuity of production of lustre tile revetments, which also required for the passing of knowledge of lustre art from generation to generation, but for which there exist monumental artworks which date to the years immediately following the period of Mongol Invasions.

a.) Ilkhanid Stuccos and their Chronological and Architectural Context

There are no written sources which could provide any indication concerning the function of stuccos and other architectural revetments of the Ilkhanid monuments. Stuccos themselves also do not provide any direct evidence indicating their function explicitly. In order to attempt information concerning the function and meaning of Ilkhanid stuccos to be proposed, it is first necessary to comprehend the context of their production: their chronological occurrence, typology and function of monuments and architectural spaces where they are located, dimensions of these decorative repertoires, their form and especially the relation between the stuccos and the focal points and sacred loci of monuments. Such comprehensive understanding of architectural and chronological context of stucco production, combined with information regarding their visual features and epigraphic programmes' content, provide some information regarding the trends of use of stucco medium, its function and meaning.

Chronology Ilkhanid Stucco Repertoires Production

Research of the selected number of Ilkhanid stucco repertoires (see Chapter 1; Section 1.5, Chapter 4; Section 4.1) enabled the chronological context of their production to be examined. Collected data reflects general trends of stucco production, but it is based on information collected from the existing repertoires and based on the possible field research for the monuments' documentation. In the first decades following the Mongol conquest of the Iranian territory, only a small number of activities connected to production of carved stuccos took place. This changed quickly and in the Early Ilkhanid period (1256-1295) the commissions comprising production of carved stuccos increased significantly; almost one fifth of analysed repertoires (18%) is likely to date from this chronological span. This trend continued and in the Golden Ilkhanid period (1295-1316) when almost half of all the discussed stucco repertoires (44%) were produced. Contrary to the general scholarly perception, the trend of production of stuccos continued into the Late Ilkhanid period (1316-1335) in which more than a third of all the Ilkhanid stucco repertoires (38%) were produced.

These trends of carved stucco production provide evidence indicating several significant points for the understanding of Ilkhanid architecture and stuccos. Firstly, they demonstrate that Ilkhanid patrons sponsored stucco revetments (mainly located in religious monuments) already in the period, which preceded the adoption of Islam as the official state religion of the Empire. Secondly, the period of Ghazan Khan's (r. 1295-1304) and Uljaytu's (r. 1304-1316) reigns has traditionally been viewed as the time in which the vast majority of monuments and stuccos were built and produced, but as shown in this research, less than half of the stucco repertoires were made in this period. Nevertheless, this is the period in which the most extensive number of stucco repertoires was produced and it indicates the close relation between the commission of stucco repertoires, the state religion and economic prosperity of the Empire. Thirdly, the research demonstrates that a considerable number of monuments and stuccos was built and decorated in the period of Abu Sa'id's reign (r. 1316-1335) and later; the period which no longer enjoyed the political stability and in which local rulers gained political power and formed independent political units (e. g. Muzaffarids, Karts, etc.).

Ilkhanid stuccos were therefore produced at a more or less constant frequency throughout the Ilkhanid period and also in the first decades following the disintegration of the Ilkhanid Empire. Carved stucco, as an architectural revetment medium, was therefore not tied to a specific political or religious ideology. Rather, it was a versatile medium employed for the production of revetment repertoires in diverse historic moments, which is reflected above all in the content of epigraphic programmes of these revetments. Stuccos were employed for specific purposes tied to political motivations for monument patronage. The constant, frequent and geographically widespread use of this medium was determined by the availability of material and craftsmen, who knew how to produce the revetments, rather than determined by specific motivations of the patrons. These hypotheses are further confirmed by the use of stuccos in other lands, spanning from Spain to Central Asia and across a chronological context starting in the pre-Islamic period and reaching into modern times.

Ilkhanid Stuccos and their Architectural Context

Carved Stuccos and their Monuments

This research inquired about the occurrence of stuccos in monuments, according to the monument types, and it allows patterns of the use of stucco revetments for monument decoration to be discerned. Among the extant carved stucco repertoires (49 repertoires), the most frequent occurrence has been discerned in congregational mosques (37%), followed by pilgrimage complexes (22,4%), mausolea (14%), residential mosques (8,2%), *imamzadas* (8,2%) and one funerary tower (2%). It is thus clear that carved stuccos were most frequently employed to decorate monuments such as congregational mosques, pilgrimage complexes and mausolea. Together, the amount of stucco repertoires in these monuments amounts to 73,4% of all stucco programmes. Most of these monuments were the focal points of the infrastructures of the settlements. They were spaces for the performance of the most significant religious rites.

The significance of these monuments, as public spaces and spaces of collective memory, is further demonstrated by the fact that in exactly half of these cases, stucco revetments of the Ilkhanid period were actually produced to decorate monuments which already existed and functioned for the communities as public spaces. Production of stuccos for monuments, which were centuries old and continuously used by communities for religious rites, enabled the Ilkhanid patrons to imprint their pious endowment acts onto architectural surfaces of public spaces and to thus assert their political authority and form the collective memory of the communities. The other half of stucco repertoires was part of newly built monuments, which were most frequently constructed in areas lacking religious infrastructure or in the context of newly founded local dynasties such as the Muzaffarid rule in the Yazd area. Such new monuments came to present focal spaces of communities and their sponsorship determined urbanistic developments of the settlements and enabled their patrons to assert their political power through pious patronage.¹⁰³⁰

But, was there a difference between stuccos of newly founded monuments and those in the already existing ones, where stuccos were works of redecoration interventions? In terms of

¹⁰³⁰ This is not dissimilar to the logic behind the construction of Ottoman public infrastructure in the lands conquered by the Ottomans. See Goodwin 1976.

level of skills of stucco production, there do not seem to have been differences between redecorations in stuccos and production of revetments for *ex novo* founded monuments. The possible difference, which is addressed in chapter 3 (Chapter 3; Section 3.3), could comprise the content and explicitness of the revetments' epigraphic repertoires. This is especially evident in redecorations, which were likely motivated by the change of the official religion of the Empire, which express the new doctrines and aspects of (Shi'i) religion, and they therefore feature distinct epigraphic programmes, compared to earlier revetments in the same monuments. No differences in terms of aesthetic appearance or technology of production of redecoration and new foundation monument stuccos have been discovered.

This research also provides information regarding patronage trends connected to the production of stuccos, which have been discussed in detail in Chapter 4 (Section 4.1). It has been shown that the majority of stucco patrons remain unidentified due to the lack of historic inscriptions or mentions of monuments in written sources. Evidence of imperial patronage has been found, but it has also been shown that the most significant social class of patrons consisted of Ilkhanid ministers and especially the Ilkhanid Empire's officials. These individuals sponsored the production of stuccos, construction and rebuilding of monuments, to demonstrate their political alliances and political power through pious acts of sponsorship of monuments and their architectural revetments. Function of stuccos thus needs to be comprehended in this context.

Information concerning the nature of stucco revetment programmes in *ex novo* foundations and redecorated monuments, enables some hypotheses regarding the general traits of Ilkhanid stucco repertoires to be proposed. Redecoration interventions (25 cases) which included the production of stucco revetments can be subdivided into three main groups: interventions which comprised only the production of architectural revetments (5 cases), interventions which consisted of monument rebuilding and redecoration (14 cases) and interventions of mihrab installation (6 cases). Characteristics of these interventions partially indicate the main features of stucco revetments and point towards their function. In the case where interventions consisted of stucco production only, the stuccos provided a new visual appearance to a monument. Their production signalled the transformation of monuments and their new aesthetics, which were accompanied by new programmes highlighting the patrons of the interventions and expressing the features of the state religion. In interventions of rebuilding and redecoration of monuments, stuccos could conceal monument modifications, transform function and focal points of architectural spaces and structures, and highlight the most important spaces through their aesthetic appearance. Epigraphic repertoires of stuccos expressed the significance of the patronage of interventions and the traits of the official religion of the Empire.

Several layers of stucco revetment function can be discerned in this respect. Installation of a stucco mihrab into an architectural space served to highlight the direction of Mecca and it thus emphasized the orientation of the monument and direction of religious rites. The installed mihrabs functioned as focal points of architectural spaces and also revetment programmes. Epigraphic programmes of mihrabs could, and often did, provide historic inscription information concerning their patronage (or of more extensive repertoires). Such inscriptions reflect the significance of patronage as a pious act and political power demonstration, as embodied in mihrabs – the focal points of monuments, which were public spaces of

communities.¹⁰³¹ Religious inscriptions of mihrabs express characteristics of the official religion in moments when the mihrabs were produced implicitly or explicitly. Four types of such inscriptions could be included into epigraphic repertoires: Qur'anic excerpts, Hadiths, invocations to God and the Shahada.

The Shahada was perhaps the most obvious means of signalling the official creed, and it is featured in focal points of a considerable number of mihrabs. Hadiths were also featured frequently; some were generic Prophetic Hadiths and the others were pointed Shi'ite texts, as best illustrated by the Uljaytu mihrab of the Isfahan Friday mosque (Cat. No. 1). Qur'anic excerpts occasionally reflected functions of monuments (for example, congregational mosque), but their research revealed that their use was fairly generic. Furthermore, the research discerned that selections of Qur'anic excerpts could have been the choices of the workshops, which drew on their own repertoires of inscriptions to produce stuccos and their designs. If so, patrons had a minor role in determining epigraphic repertoires of stucco revetments, compared to what has so far been believed by the scholarly community. Selected religious inscriptions on mihrabs accordingly reflected the time of their production and the official creed of the Empire. These epigraphic programmes were produced to be seen and also to be understood by the literate audience; they were perhaps the most important aspect of stucco revetments which most explicitly reflected their function and meaning, which were further bolstered by the visual form of the stuccos, their dimensions, location, polychromy and the overall aesthetic appearance.

Stucco repertoires which were more extensive, compared to the installation of individual mihrabs, most frequently comprised the following elements: a monumental mihrab, several monumental inscription bands to highlight architectural lines of the monuments and individual panels of stucco revetments to cover other architectural surfaces of the monuments. Occasionally, less frequent visual forms were also produced in stucco: columns to visually frame blind niches, stucco minbars, stucco cenotaphs, etc. Based on the architectural forms of the monuments, and available funds, different types of revetments were chosen by craftsmen to form decorative programmes in stucco. Differently to the later periods, in Ilkhanid times, architectural interiors and exteriors of the monuments were decorated selectively by mainly covering the most significant architectural surfaces. Only in exceptional cases did the revetment repertoires cover the surfaces of the entire monument.

b.) Stuccos and Principles of Monument Decoration

Investigation of monument ground plans and location of stucco revetments within architectural contexts, enable some characteristics behind the logic of producing and placing the stucco revetments on architectural surfaces of monuments to be proposed. Almost every repertoire featured a mihrab, which functioned as the focal point of the repertoire and was also located in the most significant space of a monument: a domed monumental prayer hall, a domed burial structure or additional prayer spaces of hypostyle architectural structures. In the case of redecorations of older monuments, Ilkhanid mihrabs often functioned as secondary mihrabs, but not always. The investigation of characteristics of redecoration interventions performed in

¹⁰³¹ The fact that several Ilkhanid stucco mihrabs (and also lustre tile mihrabs) were signed by their craftsmen indicates that these individuals attained a prestigious social status within the Ilkhanid society and religious communities.

carved stucco during the Ilkhanid period indicates that, often, older mihrabs were replaced by new ones and that small scale redecoration interventions often focused on the production of a new mihrab or redecoration of an old mihrab, above all, due to the religious significance of mihrabs and because mihrabs functioned as focal points of decorative programmes.

In addition to mihrabs, other focal points of monuments (with distinct functions), were presented by cenotaphs of revered deceased personages. They were the *raison d'être* of funerary complexes, mausolea and pilgrimage complexes, and they provided for the focal points of religious rites, although many of these funerary structures also retained mihrabs. In the Ilkhanid period, the majority of the cenotaphs were either revetted in lustre tiles, many of which have since been removed, or with carved stucco. Wooden cenotaphs of the Ilkhanid period seem not to have survived until the present times, but there are a plenty examples in the Timurid period, especially in the Mazandaran region.¹⁰³² Only a few stucco cenotaphs of the Ilkhanid period are still extant: one is found in the Imamzada Ja'far in Damghan and a large number is located in the Baba 'Abdullah complex in Na'in (Cat. No. 9). These cenotaphs in carved stucco likely indicate that such practice was more widespread in the Ilkhanid period. Due to the religious significance of cenotaphs of revered personages, they were often redecorated and in numerous Ilkhanid monuments, cenotaphs are the results of modern renovations.

Depending on the size of the produced repertoire of architectural revetments, further stuccos could be made to decorate the interiors of the most significant architectural spaces, such as domed chambers or domed prayer halls. Furthermore, specific attention was given to the area of access to the most important space(s) of the monuments. A decorative programme consisting of revetments in diverse media was normally produced to visually lead the faithful from the main entrance of at the monument to its most significant architectural spaces. This required the production of revetments on entrance portals, occasionally external surfaces of the courtyards and the *qibla iwans* preceding domed halls of congregational mosques. Frequently, *iwans* opposite *qibla iwans* were also revetted. In doing so, craftsmen accentuated the axes of monument orientation towards Mecca. Side prayer halls of mosques or less significant architectural spaces of complexes could either be left undecorated or could be decorated with visually less striking and technologically more modest revetments.¹⁰³³ The logic behind the use of stuccos and other revetments was therefore both practical and symbolic in highlighting the function of monuments, their most significant architectural spaces and the sacred loci.

Additional more specific logic of the use of stucco revetments has been observed within the micro context of stucco decorative programmes. The most significant parts of the repertoires, their focal points, above all mihrabs, were as a rule produced by the most skilled members of the stucco workshops; they featured the most complex designs and they were produced by using the most complex stucco artistic techniques. These revetments frequently displayed extremely dynamic reliefs and yet balanced compositions of panels, inscription bands and non-epigraphic designs with detailed compositions of geometric and vegetal elements. Following the focal points, the second most important elements of stucco repertoires were monumental inscription

¹⁰³² See Aube 2021.

¹⁰³³ A good example is presented by the stuccos in the side prayer halls of the Varamin Friday mosque (Cat. No. 28).

bands, which were employed to highlight architectural lines of the monuments' interiors. They were used to top the edges of supporting walls, or interior surfaces of *iwan* structures. The content and visual appearance of these bands provided for the structure of the repertoires and highlighted the function of monuments.

In addition to these, the most frequently decorated elements of the monuments were transitional zones between square structures and domed surfaces. In some instances, there is evidence of substantial revetment repertoires in carved stucco decorating the interior surfaces of dome shells, thus accentuating architectural forms of the most significant parts of the monuments. Occasionally, openings and passages of the monuments were also revetted in stucco. Similar logic was also employed in decorating *qibla iwans*, *iwans* and entrance portals, but exterior surfaces were less frequently revetted in stucco, because it was sensitive to weathering agents. There, other media, especially glazed revetments, were preferably employed. Other less significant architectural surfaces functioned as backgrounds of architectural decorative programmes and were normally decorated with stucco plugs, especially those which were carved into a layer of stucco material. These plugs could form the *Khatt-i banna'i* inscriptions which functioned as backgrounds to the decorative repertoires.

This logic of the use of different types of stuccos therefore reflects their primary function, of highlighting a selected architectural surface or a space. These principles of the use of artistic techniques and stucco production technology were therefore deliberate and served to distinguish distinct levels of accentuation-significance of the architectural spaces and surfaces. But they are not unique to Ilkhanid stuccos and similar can be said for most architectural revetments of Islamic and other monuments.

c.) Ilkhanid Stuccos and their Function

This research of monuments combined with detailed examination of the monuments' constructive and decorative chronology, allows observations concerning function and meaning of stucco revetments in their architectural context to be proposed. They are connected to the question of *why* the stuccos were installed, *when* were they installed, and *what* are their epigraphic and non-epigraphic features. Four main aspects of stucco function could accordingly be discerned: the highlighting of the monuments' function, the transformation of the monuments' function, the transformation of the monuments' function and meaning and monument monumentalization.

The mechanism behind the highlighting of the monument's function has already been elucidated above. It is important to note here that the manner in which the stuccos highlighted the function of monuments was above all tied to their application on architectural surfaces which functioned as focal points or sacred loci. For congregational mosques, residential mosques, and other types of mosques, the main focal point was always presented by the *qibla* wall and the mihrab of the monument, which could be produced in stucco or other media. Furthermore, other important aspects of monuments were axes of their orientation, interior surfaces of domed prayer halls, *qibla iwans* and entrance portals. Application of stuccos, with their specific aesthetic characteristics, thus highlighted the function of these monuments by visually accentuating their most significant architectural spaces and surfaces.

Transformation of the function of monuments was enacted frequently in the Ilkhanid period; it was performed through redecoration interventions, which consisted of the production of revetments for a monument, which already existed and possessed a function in its own right. Introduction of redecoration repertoires could change the monument's function by the means of its visual form and implications of its epigraphic repertoire. Such interventions frequently comprised minor structural modifications of the monuments. The most significant examples, not encountered in the pre-Ilkhanid period, and understood as typical of the Ilkhanid era, comprise transformation of mausolea structures into pilgrimage complexes.¹⁰³⁴ Such transformation of monument function was achieved by enlarging the mausoleum in to a funerary or pilgrimage complex, or by its redecoration or by a combination of both. In this respect, production of a new stucco repertoire could directly impact the function of an architectural space of a monument.

Architectural revetments in carved stucco, but also in other media, could be employed in a manner of functioning as elements determining monuments' transformation of meaning and function. The most visible aspect of such function of revetments is the phenomenon which has been mentioned on several occasions in this research: production of revetments with a distinct religious content and expression of a different state religion, compared to the extant function and meaning of the monument's decorative programme. These changes were enacted through monument redecoration. In this respect, the continuous and consistent phenomenon of monument Shi'itization, in connection to Uljaytu's conversion to Shi'i Islam in 1309, could be observed on a considerable number of monuments. These monuments were Sunni religious structures, which were transformed into Shi'ite monuments by the means of their redecoration with architectural revetments (above all, but not only, in carved stucco) with explicitly Shi'ite epigraphic repertoire contents. In doing so, function and meaning of these monuments changed. It is most likely that such transformations were determined by the patrons; as was demonstrated the majority of known patrons were Ilkhanid officials. If so, the state apparatus did their best to "update" monuments in accordance to the change in state religion.

Some examples are the redecoration interventions with revetments containing explicitly Shi'ite content: the second decorative phase of the interior of the core of the Uljaytu mausoleum at Sultaniyya (applied moulded and stencilled stucco combined with wall paintings and carved stucco; c. 1316/20; Cat. No. 27), the installation of the Uljaytu mihrab in the Isfahan Friday mosque (carved stucco; 1310; Cat. No. 1), the third decorative stage in carved stucco and glazed tiles at the Pir-i Bakran mausoleum (1312-13; Cat. No. 2), the Square Kufic inscription panels at the Haftshuya Friday mosque (carved stucco; c. 1310-16; Cat. No. 3), the rebuilding and redecoration of the Ushturjan Friday mosque (1315-16; Cat. No. 4) and the later phases of the 'Abd al-Samad complex at Natanz (the *Khanqah*, 1315-16; Cat. No. 12). These monuments originally displayed Sunni-oriented epigraphic repertoires. They were redecorated starting from 1310, or between 1310 and 1316, with architectural revetment repertoires which featured explicitly Shi'ite content. These monuments thus functioned as Shi'ite and no longer Sunni places of worship. This explicitly Shi'ite orientation of epigraphic repertoires on revetments was most frequently expressed in the following types of inscriptions integrated into more

¹⁰³⁴ See Golombek 1974.

extensive epigraphic programmes: the Shi‘ite Shahada, Hadiths, Benedictions to ‘Ali, Names of Orthodox Caliphs combined with those of Hassan and Husayn, Blessings to the Prophet and the Fourteen Infallibles, al-Asma’ al-Husna and Blessings to the Prophet and the Twelve Imams.

Another function of stuccos and other revetments was that of monumentalizing the appearance and prestige of a monument. This could be achieved by producing extensive architectural revetment repertoires at the time of monument construction or as a redecoration intervention. In doing so, the product – the extensive revetment programme, highlighted function of a monument and transformation of its visual appearance through its aesthetic characteristics. The produced revetment repertoire was of significant function also in highlighting the status of the patron and his significance in sponsoring pious endowments. Perhaps the best example of use of carved stucco in such a manner is the 1154 redecoration of the caravanserai of Ribat-i Sharaf in north-eastern Iran.¹⁰³⁵ Ilkhanid examples of such function of architectural revetments are also numerous. For example, the extensive programme of the third decorative campaign at the Pir-i Bakran mausoleum also comprised cladding the majority of its surfaces with glazed star and cross tiles. The majority of redecoration interventions which took place in the Ilkhanid period and which comprised production of a new decorative repertoire occurred for similar reasons: the coating with carved stucco of the cenotaphs at the Baba ‘Abdullah complex at Na’in (Cat. No. 9), the redecoration of the Farumad and Khusraw Shir Friday mosques (Cat. Nos. 16, 17), the rebuilding and redecoration of the Bayazid Bistami complex at Bistam (Cat. No. 19), production of new carved stucco mihrabs for the Seljuq Friday mosques of Urumiya and Marand (Cat. Nos. 23, 22), the production of the carved stucco mihrab and lustre tiles for the Pir Husayn Khanqah at Qubalibalaoğlan (Cat. No. 25), the addition of a carved stucco mihrab in the Sava Friday mosque (Cat. No. 34), the redecoration of the mihrab of the Sujas Friday mosque (Cat. No. 35) and the production of the stucco repertoire for the Khizr mausoleum at Hamadan (Cat. No. 37).

These four discerned mechanisms behind the use of carved stuccos, and thus the four main aspects of their function and meaning are not unique to the carved stucco medium. This research shows that there existed a hierarchy between diverse decorative media, but also a clear logic of their use and preferences according to types of architectural surfaces. Solutions were more pragmatic, compared to what Islamic art historians normally admit, and stucco was often the medium of revetments due to the availability of craftsmen, relative ease of its production and moderate costs, compared to the lustre tile medium. But the function and meaning of Ilkhanid architectural revetments was related, if not shared, and this research did not reveal differences between them. The four outlined aspects of function and meaning of carved stuccos should thus be understood as also characteristic of other Ilkhanid revetment media, such as lustre tiles, glazed revetments, wall paintings and applied moulded and stencilled stuccos.

d.) Ilkhanid Stuccos and their Meaning

The purpose of production and function of stuccos within their architectural contexts ultimately determined their meaning. In being produced, stuccos, like other revetments in distinct media,

¹⁰³⁵ Kiyani 1981; <https://archnet.org/sites/3873> (Last Accessed: April 15, 2021).

became material culture which was the expression of its time and culture, and which thus reflects the socio-political context. This is especially well demonstrated by the analysis of epigraphic repertoires on monuments which evidenced the communication of the official faith of the Empire by the means of production of stuccos with specific epigraphic programmes. This research illustrates that historic inscriptions on stucco repertoires were of the utmost significance in communicating the identity of the patrons of the monuments and their stuccos. In fact, the two outlined aspects of epigraphic programmes – to communicate the religious and patronage messages are the most important elements which determined the meaning of stuccos. Patronage of monuments, specifically of public ones, was almost always politically motivated. Within this context, information concerning patronage by the stucco epigraphic repertoires assumed the specific role of communicating information about patronage and it thus conveyed one of the most significant messages of the patron to the faithful, in addition to the religious content inscriptions. With their unprecedented aesthetic appearance, locations in the most essential parts of monuments, and frequently extensive dimensions, stuccos reflected the significance of a sacred public space, and impacted the collective memory of the religious community, and reflected the might of their patron as well as the significance of religion. Stuccos and other revetments therefore assumed the role of the medium of communication between the state, the state officials and the faithful. Stucco craftsmen were those who translated these messages into the carved stucco medium, which was, in the Ilkhanid period, of unprecedented complexity and inventiveness of design and production technology, and aesthetically pleasing appearance.

Epilogue

This research of the Ilkhanid monuments with carved stucco decorative programmes sheds light on some important aspects worth considering for future cultural heritage preservation practices in Iran. Moreover, some remarks about the practice of architectural heritage preservation and its relationship to the theory of restoration and theory of cultural heritage preservation can be discerned. Scientific research of stuccos is of essential significance for the success of conservation interventions, and monument documentation, in all forms, is of great importance for future interventions on these architectural structures.

Western scholars often criticize the perceived neglect of Iranian monuments, due to their lack of understanding of the architectural preservation context and the state of architectural heritage preservation in Iran. It is erroneous to judge the preservation state of a single monument without juxtaposing it with numerous other monuments, which form its context. It would be inaccurate to suppose that all Iranian monuments can be restored in a short period of time, and with all necessary interventions. Rather, a long-term plan of preservation interventions has to be adopted to cater to all the numerous monuments. This research should be a useful lesson for the understanding of the context of architectural heritage preservation along the Silk Routes and in Iran. These monuments have not been subjected to extensive and constant restoration interventions during the last two centuries in contrast to their European counterparts. Their state of preservation, thus utterly different, should be considered as the starting point for an assessment of necessary preservation measures and conservation interventions.

This discussion of Ilkhanid monuments and their stuccos yields some observations and recommendations for future interventions aimed at the preservation of these monuments. It has been illustrated that many Ilkhanid monuments have been the focus of preservation activities. These monuments are currently in a relatively good state, structurally, but they would necessitate interventions focusing on consolidation and preservation of their architectural revetments. These interventions should be performed in parallel with archaeometric research, which will enable the researchers to discern the optimal ways to preserve stuccos, wall paintings, the other revetment media, and their polychromy. Research of these monuments, and their preservation, should also have a positive impact on local communities and the tourism industry. Experts should now perhaps prioritize structures that have not yet been sufficiently preserved, as shown in this research.

The question of future preservation activities on Ilkhanid monuments largely depends on the amount of the research that will be performed on these buildings. The little discussed aspect of Ilkhanid polychrome revetment surely deserves scrutiny by archaeometrists and art historians. Moreover, it is of the utmost importance that the existence, characteristics, and amount of the existing stucco repertoires are systematically documented. Their documentation will assure the preservation of data for their future research, given that it is plausible that their conservation will not be completed in a short time span. Lessons learned from this research are of importance for the discussed monuments and they will hopefully be useful for the future preservation of architectural heritage in Iran and the neighbouring lands.

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