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**THE ARAB AND ARAB ISLAMIC AND MUSLIM ARCHITECTURE**

**OF THE OLD HOLY MASJID AND AL-KA'ABAH**

**A Monadic Interpretation of the Two Holy Buildings**

**by Eduard Franciscus Schwarz**

**A Thesis**

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**The Holy Complex in Makkah al-Mukarramah in Saudi Arabia**

## Acknowledgments

Although I belong to those who were indirectly indoctrinated by the Bauhaus, Architecture has moved well away from the Bauhaus architecture and Bauhaus philosophy into that can be referred to as labyrinth architecture with a poetic base. However, the tendency to perceive architecture as a body poetic needs to be queried. That architecture had moved away from the architecture advocated by the Bauhaus was particularly realized during my study at Massey University, Wellington Campus, during 2004. Contact with art students and staff, trained in art and fashion were very useful. Without the help of others, the writing of the thesis would have been more difficult. My thanks go to Professor Duncan Joiner, who was my supervisor. I am also thankful to the Massey University Library, Wellington Campus that carried out a literature search in support of this work.

Massey University also provided me with computers for the writing of the work. Brian Halliday, now retired, needs mentioning here, so does Ken Elliot for the constant help he gave computer-wise. Yet the amount of time involved in preparing a complete computerized document, inclusive of graphics, has been very large, to the detriment of preparing creative designs with pen, pencil and ink.

Attached to writing of a thesis is always the factor of cost. I am happy to say that the Internal Grants Committee of Massey University made available a series of small but welcome grants to me. Nevertheless, the greater part of the total cost incurred is mine. The Director General of Islamic Call Affairs at RABITAH in Makkah \* (see Glossary), Dr. Hashem Ali Moh Mahdi, needs mentioning here for his support during my fieldwork in Makkah in 1993. Dr. Khalid Sandhu of Wellington helped to set up the RABITAH connection. Without that connection no thesis on Makkah would have come about. Equally so for the unknown Arab of the Library of the Umm al-Qura University, who lent me a copy of the Kingdom of Saudi Arabia Engineering Report covering the Holy Complex. It proved to be one of the points of departure for this work.

## **Thesis Abstract**

This thesis covers the architecture of the Old Holy Masjid\* (see Glossary) in Makkah (Mecca) and to a minor degree the architecture of al-Ka'abah\* (see Glossary) also in Makkah. The shapes and spaces of those two Buildings are examined monadically applying a partial new Theory of Architectural Monadology. The Buildings' shapes and spaces are examined on their attached qualities, the way these configure and or correspond with other shapes and spaces. When attachments are made to shapes and spaces they become monads, configuring and corresponding with other monads. This draws-in the cosmos, the landscape, myth, folklore and the *Qiblaat* system (direction to Makkah).

By accessing architecture under the umbrella of the Theory of Architectural Monadology, together with other techniques of analysis, the conclusion is reached that the Old Holy Masjid is a Building of Arab Islamic and Muslim architecture and al-Ka'abah Building of Arab architecture. The differences and similarities between these two architectures are discussed, so are their exports as design models motifs. The historically created misconceptions about the Buildings, the Buildings' chronologies and the materials used in their construction are detailed.

## Preface

In 1989 CE (1410 AH) and 1993 CE (1414 AH) (CE stands for Christian era and AH for After Hegira) (See Appendix One)<sup>1</sup> I visited Makkah and the Holy Complex, a Complex that consists of al-Ka'abah and the Old and New Holy *Masajid* (plural for Mosque). To me, the Old Holy Masjid, a Building depicted in a drawing by Ali Bey al-Abassi (1814: Plate LIV) resembled a Classical Renaissance Building mainly because of its facade arches and the facade medallions. A photograph by the Kingdom of Saudi Arabia, Ministry of Information (n.d. and no pp.) in *Expansion of the al-Haramayn al-Sharifein*, reinforced the earlier impression that the building was one of Classical Renaissance architecture. At a first glance, I believed that this was so because the facade medallions reminded me of the medallions of the arcaded court of Bruno Brunelleschi's Foundling Hospital (Spedali degli Innocente) in Florence (Allsopp, 1959: 19) and Pesvner (1963: 176).

A closer examination of the Building was made during my second trip in 1993 CE (1414 AH) revealed that **the Building** was not a Renaissance one at all; it was Building of Arab Islamic architecture, an architecture that is synonymous with Muslim architecture rooted in the Arab architecture of al-Ka'abah. Arab Islamic Muslim architecture embeds in the Old Holy Masjid as the Building consists of Umayyad, Abbasid and Ottoman architectural components. The latter are the Arab domes and the front colonnade columns. Superficially, the domes look like Ottoman domes. The latter have octagonal bases whereas the Arab domes of the Old Holy Masjid have square bases with rounded corners. The Arab Islamic and Muslim architecture of the Old Holy Masjid is further recognizable by pinnacles, crenellations, medallions, interlocked arches and the floor plan pattern and the Ottoman facade and the interior palm tree-like columns. The 'Arab dome', which corresponds with the camel's hump, is the preferred name in this thesis.

This Arab Islamic and Muslim architecture differs from the architecture of the buildings of Islam of Iran, Spain, and Samarkand that are labelled by a number of art historians, buildings of 'Islamic architecture'. That term was, and is, art historians' nomenclature to what essentially is Muslim architecture that intertwines with Arab and Arab Islamic architecture. Most art historians have portrayed the buildings of Islam from a Euro centric perspective and stereotyped it 'Islamic architecture'. In this thesis this phrase is replaced by 'the architecture of the buildings of Islam'.

Once it was clear to me that it was not a classical Renaissance Building, research on the Old Holy Masjid became focused. Although the intention was to study the Old Holy Masjid exclusively, it became increasingly clear that the architecture of

al-Ka'abah could not be ignored. Most important, the *Qiblaat* system, a system of worldwide axes to al-Ka'abah, that is an integral part of al-Ka'abah, could neither be ignored. Initial research between 1989 CE (1410 AH) and 1993 CE (1414 AH) was spent on reading. It was followed-up with fieldwork in Makkah and Jeddah. It consisted of observations, particularly the observation of the stars and star patterns and local architectures, note taking, discussions, interviews, sketching, and the taking of photographs. They became an essential part as research methods.

Institutions and places visited in support of the study were the Umm-al Qura University in Makkah, Massey University, Wellington Campus, Victoria University of Wellington, National Library of New Zealand, Wellington City Council's Central Library, the National University of Singapore Library, the Singapore Central and Ang Mo Kio New Town Public Libraries, De Rijks Universiteit of Leiden, Het Rijks Museum of Amsterdam, De Universiteit of Amsterdam Bibliotheek, De Regionale Bibliotheek of Zeeland, the Hajj Research Center and the *Kiswah* factory both in Makkah. All institutions were probed on related material. Network consultations were conducted with the Kingdom of Saudi Arabia Embassy in Washington via Ohio University, the Semitic Museum and the Aga Khan Organization both at Harvard University, the Aramco Organization in Houston, Texas and the U.S. Naval Observatory, Astronomical Applications Dept. (2004), Washington DC: using [www.srrb.noaa.gov/highlights/sunrise/azel.html](http://www.srrb.noaa.gov/highlights/sunrise/azel.html)

Considerable difficulties were experienced in taking photographs in Makkah. Saudi Arabia Officials, but also individuals do not take kindly to some one taking photographs in public. Islam does not favour images of persons. Subsequently effective camera focusing was not always possible. It resulted in 'snapshot photography' with all its shortcomings. Due to the high contrast locally between sunlight and shadows, images became under exposed. This was less so in Mina\*, Muzdalifah\* and Arafah\* (see Glossary). There, the taking of photographs was easier to undertake and the results have been better.

Because of the difficulties in taking photographs, route reconnaissance preceded the taking of photographs. If the objects to be photographed were near police or military points the intended photography was abandoned. In the areas intended for study the police and the military are everywhere. The taking of photographs could neither be done when people were nearby. Thus selecting the most advantageous position for taking photographs was out of the question. After three times having been pulled into a police station, being questioned and the threat to destroy the camera dampened the enthusiasm for taking of photographs.

Although there was access to the Umm al-Qura University, no permission was given to take photographs by a difficult Arab of wall pictures, only note taking was allowed and than for one specific aspect only. Thus a browse of the Makkah Room was out of the question.

To overcome this difficulty, and difficulties, generally a number of contacts were set-up, at that same University to be followed-up later in New Zealand, but there was no response to questions or correspondence or e-mails. Promises came easy, but were not often honoured. Even so, a good interloan library system would have alleviated some of the problems experienced. But none is in existence between New Zealand and Saudi Arabia. This in part was overcome by buying books in Makkah and Jeddah and by relying on pilgrims bringing back some publications. In both instances the maximum weight that can be taken aboard an aeroplane started to govern.

Locally produced books and publications invariably emphasize the Saudi Arabian Kings and their Kingdom, but a bibliography, page numbers, publishing dates and publishers are often absent. The material produced is more or less propaganda for the Kingdom, like Louis XIV of France and his Versailles palace. The Saudi Arabian material is often too detailed, and critical analyses and or reasoning are missing. Nevertheless some publications that came to hand in 2005 contained photographic material not seen before.

### **Overview of Chapters**

This thesis consists of seven Chapters and ten Appendices. Chapter 1 introduces the thesis, outlining the framework under which it is undertaken. It introduces the Theory of Architectural Monadology and the *Qiblaat* system. The research methods used in this study are explained.

Chapter 2 put forward the intellectual basis and theoretical framework of the thesis. This involves a full coverage of the Theory of Architectural Monadology and its application to architectural shapes and spaces. Chapter 3 sets the Holy complex in its surrounding landscape and in its cosmic settings. The same Chapter introduces the *Haraam* (Sacred areas of land) and non-*haraam* areas and highlights the consequent *sous entendu* of place (meaning that imparts identity of place or the feel of the place). A *sous entendu* is a construct or structure or an assemblage consisting of contributing components.

Chapters 4 and 5 are the **core** of the work. Chapter 4 investigates al-Ka'abah as a monadic and as an architectural construct. Its forms, shapes and spaces, and

symbolic and monadic content are detailed. The inconsistencies in the different statements by different authors are noted. Consequently, it is demonstrated that the Building is one of Arab architecture. This draws-in configurations and correspondences between the different spaces and shapes of both Buildings. A chronological account of the construction, renovations, and building materials used in both Building is discussed. The *Qiblaat* system is further detailed.

Chapter 5 focuses on the Old Holy Masjid as a monadic and as an architectural construct. Its inherent numerology and al Ka'abah as a series of abutting and adjacent ka'abaat that makes for the Old Holy Masjid's floor plan are detailed. Consequently, it is demonstrated that the Old Holy Masjid is an architectural construct of Arab Islamic and Muslim architecture with Umayyad and Abbasid and Ottoman components. Its forms, shapes and spaces, and symbolic and monadic content are detailed. This draws-in configurations and correspondences between similar spaces and shapes. These are highlighted. The anthropomorphic, the zoomorphic and the botanic contents of the Building are discussed. The column patterns, the different types of columns, column patterns, column capitals and bases are detailed. A chronological account of the construction, renovations, and building materials used in the construction of the Building are detailed. The chronological and general inconsistencies are noted. Some aspects of monadic numerical ordering are broached.

Chapter 6 covers the Old Holy Masjid, the Safa\* (see Glossary) entrance and exit and al-Ka'abah's influences as architectural models for other Buildings of Islam and as design motifs for illustrations, miniatures, ceramics, textiles and metal objects.

Chapter 7 provides the aggregated conclusions on the issues examined, mostly inconsistencies in the accounts and chronological data of the different authors and the effects of monadology. This chapter also indicates follow-up research.

Of all the Buildings (see below illustration) only al-Ka'abah and the four elevations of the Old Holy Masjid have remained. The changes to the Old Complex but also to other historic building of Makkah have been destructive, almost a wanton act of official vandalism. It made the Daniel Howden (in RIBA World Issue 380 - August 12 2005 - Ref: 29),referring to a well known Saudi architect,remark:

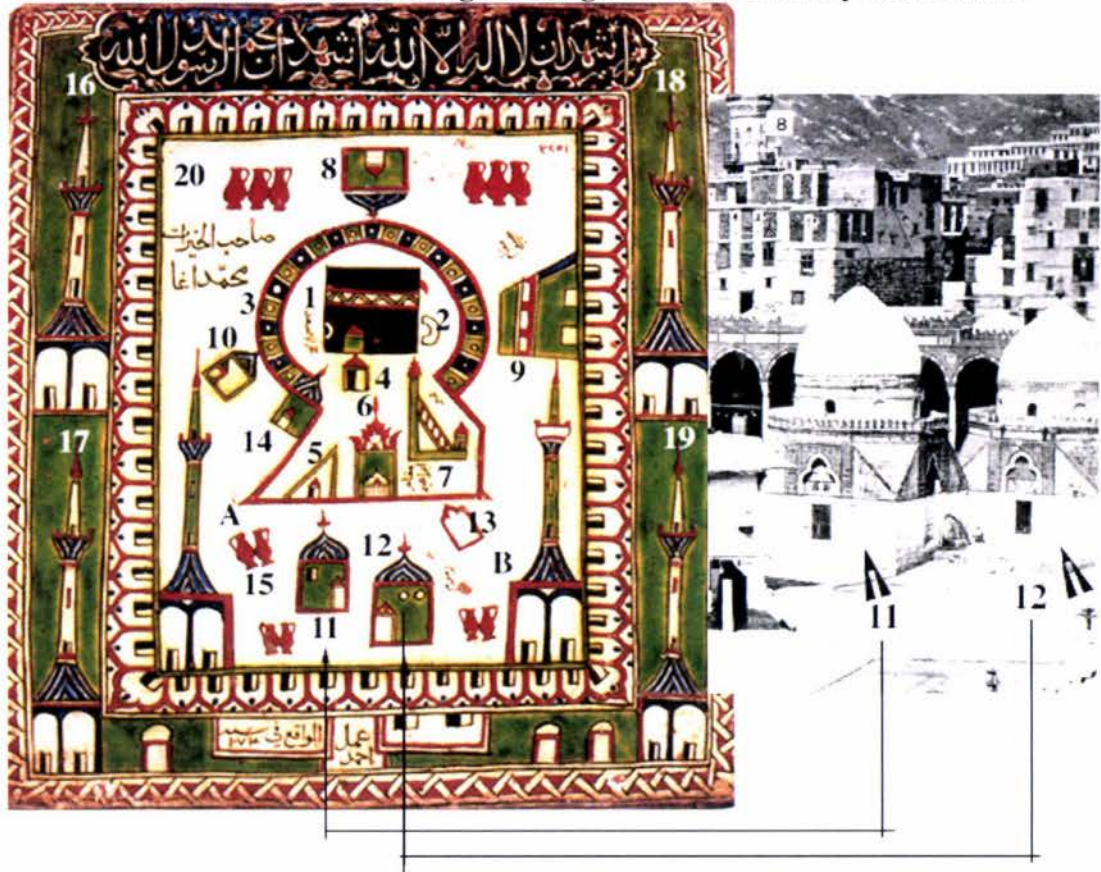
**“What we are witnessing are the last days of Mecca and Medina, the final farewell to [old] Mecca is imminent”.**

That Saudi architect is an acknowledged specialist on the region's architecture of the Buildings of Islam. He presented a paper in 1981 called "The Conservation and



Development of the Holy Cities of Mecca and Medina', in Arab Urban Development Institute/Arab Town Organization / The Symposium High Committee (Editors), in *Paper Abstracts; Symposium on the Arab City; Its Character and Islamic Cultural Heritage*, Medina: The Symposium High Committee, pp.8. His plea contained in his paper has fallen on deaf ears.

**al-Ka'abah and surrounding buildings in a 16th Century Turkish tile**



No	Description	No	Description
1	al-Ka'abah and al-Mataf* (see Glossary)	11	<i>Qubbat al-Abbas</i>
2	al-Hatim* (see Glossary)	12	<i>Qubbat al-Sa'ad</i>
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8	<i>Maqam Maliki</i>	18	<i>Manarah al-Umrah</i>
9	<i>Maqam Hanafi</i>	19	<i>Manarah Salam</i>
10	<i>Maqam Hanbali</i>	20	<i>Hawasi</i>

Sources; LH illustration, Hattstein, (2000: 12).RH illustration, Sadiq Bey (in Badr el-Hagi, 1997). Labelling and numbering by Eduard Schwarz

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## Notes, Abstract, Acknowledgements and Preferences

<sup>1</sup> In this work the simplified conversion CE to AH table of Facey (1990: 9), in *The Kingdom of Saudi Arabia*, is used (It is appended to the back of this document as Appendix One). A computer program by Adel, A. al-Rumaih, *the Hijir-Gregorian Calendar 1996-1997* <http://beautifulislam.net/programs/HijriConverter> is also a useful program in converting CE to AH. Thus 22/10/2033 CE is 28/07/1455 AH.

### References in this Preface

Adel, A. al-Rumaih, *the Hijir-Gregorian Calendar 1996-1997* <http://beautifulislam.net/programs/HijriConverter>

Allsopp, Bruce (1959), *A History of Renaissance Architecture*, London: Isaac Pitman & Sons, Ltd., pp.19.

Badr el-Hagi (1997), *Saudi Arabia Caught in Time 1861-1939*, Reading: Garnet Publishing,

Facey, William (Editor in Chief) et-al (1990), *The Kingdom of Saudi Arabia*, London, New Jersey: Stacey International, pp.9.

Hattstein, Markus and Delius, Peter and the Islamic Museum, Cairo (2000), *Islam Art and Architecture*, Cologne: Köneberg, pp.12.

Howden, Daniel (2005), 'The Destruction of Mecca', in ( Issue 380 - August 12 - Ref: 29) *RIBA World 2005*, London, the Architectural Press.

Kingdom of Saudi Arabia, Ministry of Information (n.d.) *Expansion of al-Harameyn al-Sharifeyn*, Damman: al-Mutawa Press Co., no pp.

Pesvner, Nikolaus (1963), *An Outline of European Architecture*, Harmondsworth, Middlesex: Penguin Books, pp.175.

Sadiq Bey (in Badr el-Hagi) (1997), *Saudi Arabia Caught in Time 1861-1939*, Reading: Garnet Publishing, pp.12 [Photographs first published in 1880].

**THE ARAB AND ARAB ISLAMIC and MUSLIM ARCHITECTURE OF THE  
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 A Monadic Interpretation of the two Holy Buildings**  
 Foreign languages are expressed in *italics*. See Glossary for  
 the translation and transliteration

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Source; Marsden, Brian and the U.S. Naval Observatory, Astronomical Applications Dept. (2004), *Altitude and Azimuth Tables*, Washington DC : The Observatory, <http://www.srb.noaa.gov/highlights/sunrise/azel.html> and [marsden@metervice.com](mailto:marsden@metervice.com)

#### Table 3

#### Altitude, Elevation and Declination of the sun for Makkah

Source; Marsden, Brian and the U.S. Naval Observatory, Astronomical Applications Dept. (2004), *Altitude and Azimuth Tables*, Washington DC : The Observatory, <http://www.srb.noaa.gov/highlights/sunrise/azel.html> and [marsden@metervice.com](mailto:marsden@metervice.com)

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