



Volume 9, 2011 (Published in 2017)

# FRONTIER ARCHAEOLOGY | 9

Research Journal of the  
Directorate of Archaeology and Museums  
Government of Khyber Pakhtunkhwa,  
Peshawar-Pakistan.

Chief Editor  
M. H. Khan Khattak

Editor  
Abdul Samad

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# FRONTIER ARCHAEOLOGY

9

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Price: PKR 1500/-

US \$ 30/-

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## Editor's Note

Thanks to Almighty Allah that we were able to bring out volumes 6 and 7 of the Frontier Archaeology within the shortest possible time. Volume 8 was delayed a bit mainly because all the papers included in this issue were sent to eminent scholars for review. This issue contains important papers/articles on different aspects of archaeology.

Rahman Dheri in the Gomal Plain representing the Bronze Age in the southern part of Khyber Pakhtunkhwa is an important archaeological site. This site was first excavated by Peshawar University from 1970-71 to 1990-91, but keeping in view its importance, the Department of Archaeology & Museums, Government of Khyber Pakhtunkhwa in collaboration with University of Peshawar decided to re-investigate Rahman Dheri on new lines with different goals and techniques to unearth more aspects of this proto-literate society of the 4th and 3rd millennium BC. Dr. Abdul Samad and Dr. Zakirullah have shared results of their efforts, further highlighting the importance of this site. We leave it to our worthy readers to decide as to how far the use of new tools for survey and documentation of the archaeological features of the site were successful in achieving the aims and objectives set by the excavators.

Swat Museum has different collections of the sculptures which had not been properly studied by archaeologists and hence remained in obscurity. Now research scholars are paying attention to the importance of their study to be shared with the scholarly world. PhD scholars at the Taxila Institute of Asian Civilizations (TIAC), Quaid-i-Azam University and Department of Archaeology, Peshawar University have encouraged PhD scholars registered with them to choose some of such collections in Swat Museum and in the reserve collection from erstwhile Sub-Regional Office (SRO), Department of Archaeology and Museums, Government of Pakistan at Peshawar (Now with the Directorate of Archaeology and Museums, Khyber Pakhtunkhwa) for proper study and documentation. "Varia Collection" in Swat Museum is one such collection that was never scientifically studied and documented. Here, Mr. Abdul Ghafoor, a PhD scholar registered with the TIAC has shared brief history, classification and statistical analysis of the stone sculptures from this important collection. The article gives a very good idea about the sculptures and their possible provenance. The ultimate study of these sculptures by the researcher will throw volume of light on the importance of these sculpture and greatly help in reconstruction of the lost glory of Buddhism in Swat.

The article of Dr. Muhammad Hameed titled "Cruciform Relic Casket from Shaikhan Dheri Reliquary: An Appraisal with Special Reference to its Iconographical Treatment" shares the utility and iconographic significance of the relic casket from Sheikhan Dheri. This reliquary represents different episodes of life of the Buddha on its four facades. The author presents a comprehensive study of the narrative depiction and comparative analysis of each depiction with the general Gandharan reliefs. Dr. Hameed has also tried to correct some of the misunderstood scenes on this reliquary by the earlier researchers. We hope that this study will be of great interest to our worthy readers.

We have another good effort by Mr. Tahir Saeed another PhD scholar at TIAC who has undertaken classification and stylistic analysis of the Buddha images in stone in the rich collection of the erstwhile SRO presently housed in the huge reserve collection of the Directorate of Archaeology and Museum, Khyber Pakhtunkhwa. The sculptures studied by the researcher include those from known archaeological sites in Khyber Pakhtunkhwa and those confiscated by different government agencies. The study when

completed would be of great importance to archaeologists, while looking for comparison and stylistic analysis of new finds.

We have also included the article of Dr. Ute Franke titled “Bagh-e Babur: Renaissance of a Mughal Garden in Kabul, Afghanistan”. This is a very interesting and thought provoking effort by the author. The article enumerates the great efforts involved in rehabilitation of the historic garden according to its historical layout. The great efforts involved extensive archaeological research with multi-disciplinary approach and an in-depth study of the garden and its development through times. After reading the article, one could easily appreciate the great efforts by the author in reconstructing the garden according to original pattern in the absence of authentic source material. The research undertaken at Bagh-e-Babur would also be of great help in similar research on the Mughal period gardens in Pakistan and India.

I take this opportunity to thank the contributors to our journal and request all the scholars and researchers to send their papers, articles and reports for publication in subsequent volumes of our journal.

( M. H. Khan Khattak )  
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Peshawar, the 16<sup>th</sup> August , 2016.

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# The Bhamala Buddhist Complex: A Review of Earlier Investigations at Bhamala

Abdul Samad, Mark Kenoyer, Abdul Hameed and Shakirullah

## Abstract:

*The Buddhist complex of Bhamala is located on an ancient route through the Muree and Margalla hills that connected the Taxila valley with Kashmir. According to Marshall, the Bhamala Buddhist Complex being located at the head of Haro Valley, at the foot of Murree hills and protected by Haro River and the range of mountains all around might have provided an ideal environment for the Buddhist monks and bhiksus to carry out their daily activities smoothly without the interruptions of the small band of invaders. The site enjoys a unique geographical position as it is surrounded by the Haro River on its north-eastern and eastern sides and lush green mountains on the northern and north-western sides. The first field investigation at the site was carried out in 1930-31 by Sir John Marshall who selected the eastern most part of the site where the remains of the ruined stupa were clearly visible. The first archaeological excavation led to some remarkable discoveries in terms of artifacts and structural remains. The significant discoveries during the earlier research at the site included the unveiling of the Cruciform Stupa, different religious and secular structures, a large number of archaeological artifacts including stucco sculpture fragment, copper coins, relic casket with bones, beads of different materials including glass, agate and coral etc. In addition, a gold ornament, and large number of potsherds were also collected during the process of excavation. But the most important of all was the parinirvana statue of Buddha in stucco reported from the main stupa. The antiquities reported during the first excavation are now exhibited in Taxila Museum. However, after Sir John Marshall, no major field investigations were carried out at the site for almost 81 years. In 2012-13 excavation was resumed at the site by the Department of Archaeology, Hazara University, Mansehra in collaboration with the University of Wisconsin (USA).*

**Key words:** Bhamala, Taxila Valley, Sir John Marshall, Cruciform Stupa, Parinirvana.

## Introduction:

The Buddhist complex of Bhamala (Fig. 1) is located, at 33° 49.971' N and 72° 58.554' E, in the extreme northern part of the Khanpur valley (a sub-valley of the Taxila Valley). An ancient route through the Muree and Margalla hills that connected the Taxila valley with Kashmir ran along the left bank, and opposite to the Bhamala site, of Haro River on the east and lying on the north-eastern route towards Mansehra (Dani 1999: 148). Being located at the head of Haro Valley, at the foot of Murree hills and protected by Haro River and the range of mountains all around the Bhamala Buddhist Complex might have provided an ideal environment for the Buddhist monks and bhiksus to carry out their daily activities smoothly without the interruptions of the small band of invaders (Marshall 2007: 171). The only real objection to the position would be its greater distance from the major city as it would not have been possible for the bikşus to do their begging. Sir John Marshall is justified to say that until Bhamala was founded the Buddhist monks were living in well provisioned monasteries (ASI Annual Report 1930-34:152; Report of the Tokyo National Museum Archaeological Mission to Pakistan 2013:394 Marshall 2007: 171).

Presently the site is approached through a link road (Pumbhala Road; Fig. 2) leading to the small village locally known as Pumbhala to the northern and north-western sides of the site. This adventurous road runs along the western side of the Khanpur Dam thus one can enjoy the beautiful view of the Dam while reaching to the Buddhist complex of Bhamala. The site enjoys a unique geographical position as it is surrounded by the Haro

River on its north-eastern and eastern sides and lush green mountains on the northern and north-western sides. The Khanpur Dam located on the southern side further enhances its beauty. During the summer due to the raise in the water level the site is approachable through small boats easily available on rental basis.



Figure 1. Satellite image showing the Bhamala Buddhist Complex

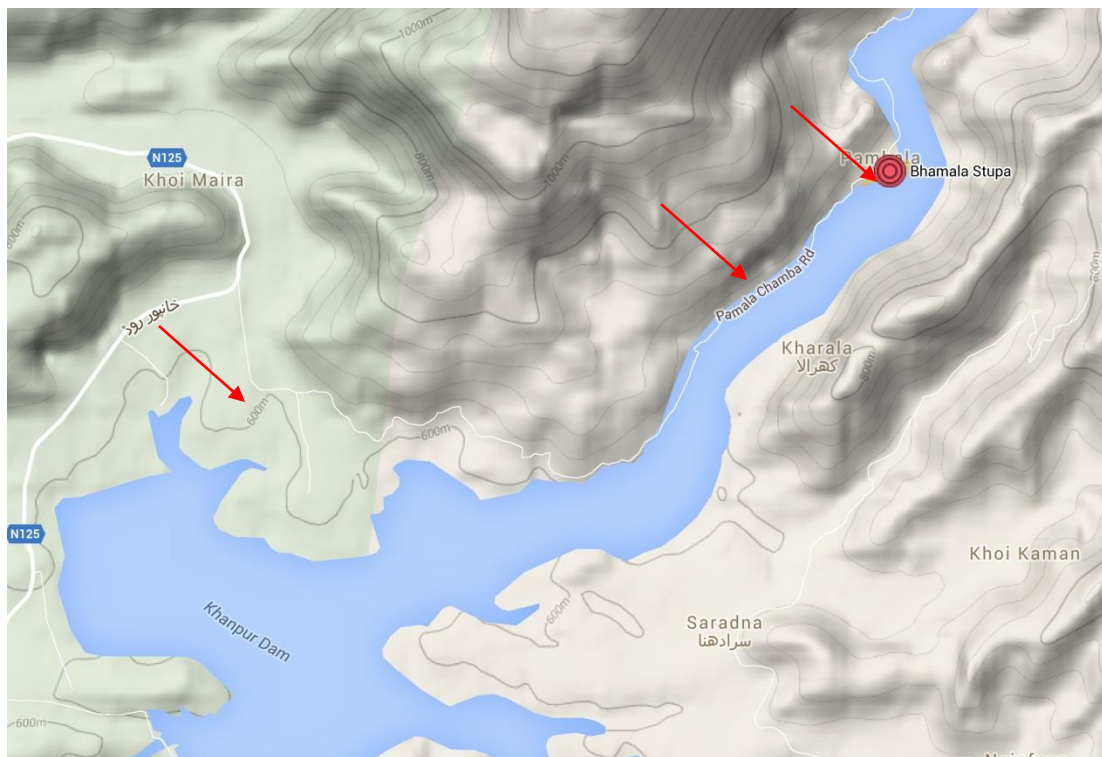


Figure 2. A View of Pumbhala Road running on the western bank of Khanpur Dam leading to Site the

## Previous Archaeological Investigations at the Site

The first field investigation at the site was carried out in 1930-31 by Sir John Marshall who extensively excavated the Buddhist and secular establishments of Taxila Valley for nearly two decades in the early twentieth century (Marshall 2007). At Bhamala, he selected the eastern most part of the site where the remains of the ruined stupa were clearly visible. The first archaeological excavation led to some remarkable discoveries in terms of artifacts and structural remains. An overview of the major discoveries is given as under:

### The Cruciform Stupa

The cruciform stupa (Fig.3) reported during the excavation conducted by Sir John Marshall was the first example at Taxila and one of the rare discoveries made in Gandhara and Udhyana. The stupa is provided with four flights of steps and a Chakra (Fig. 4) on the eastern side right in front of the eastern flight of steps. The principal stupa is surrounded by 19 small stupas and chapels to the east while the floor level was paved with terracotta tiles decorated with floral and geometrical designs. The main stupa, according to Sir John Marshall rose up to 30 feet at the time of excavation (Marshall 2007:172) which has now decreased due to heavy rain and erosion (Fig. 5 & 6).

No evidences of cross planned stupas have been reported from Taxila except from Bhamala however, we do have the evidences for comparison reported from surrounding regions. The best example for comparative analysis is cross planned stupa reported at Zar Dheri. The Site is located in district Mansehra about seven km to the north of Shinkari town on the right side of the Karakorum Highway. It was for the first time reported by H. Hargreaves in 1922. Excavations at the site were carried out by the Tokyo National Museum Archaeological Mission to Pakistan in collaboration with the Department of Archaeology & Museums Government of Pakistan from 1995-1999 (Hargreaves 1922-23: 96-97)

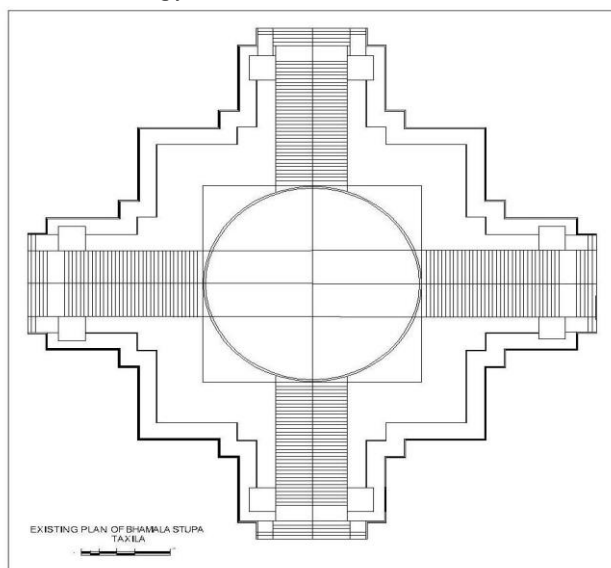


Fig. 3. Bhamala Excavations 2014-15: Plan of the main stupa

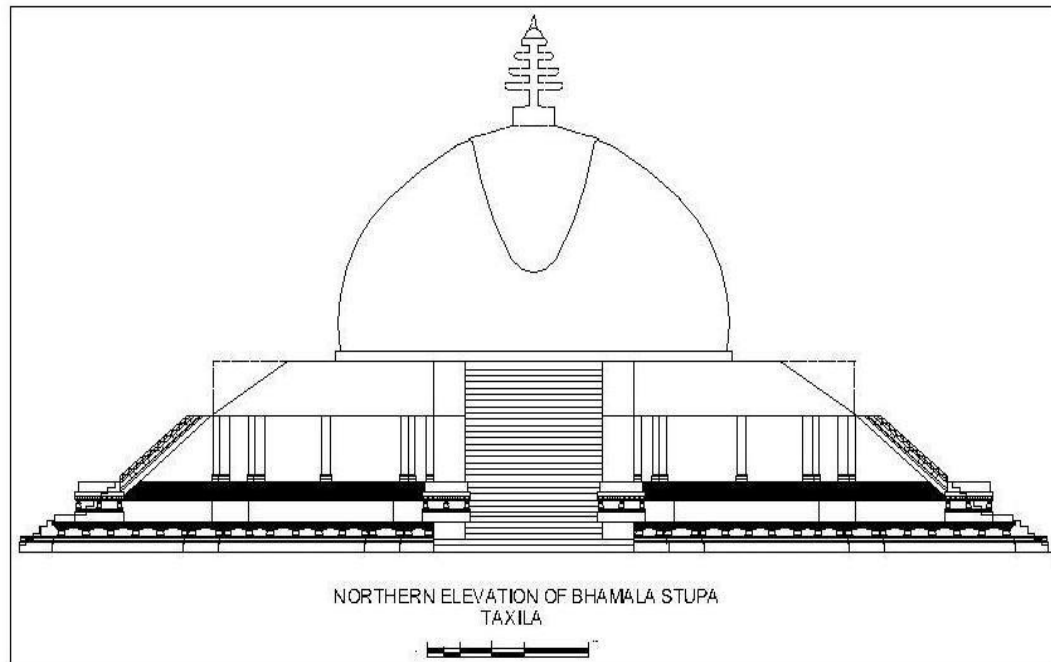


Fig.6. Bhamala Excavations 2014-15: Northern Elevation of the Main Stupa

The Zar Dheri Stupa shares many common features with the Stupa of Bhamala. Both these stupas are cross planned and are provided with four flight of steps one on each side. However, the forms of stairs at the two sites are presently a little different. In Zar Dheri the lowest part of the stair is the widest and it gets narrow near the plinth. While, in Bhamala there is a stair landing half way across the stairs, and from the point corresponding to the landing is attached a low tier, therefore, even though the width of the stair remains the same, the plain of the staircases becomes a bit wider towards the plinth. This low tier reaches the foundation of the plinth and on the sides of the stairs placed stucco Buddha in seated position. And on the south eastern corner of the joint of the salient and the plinth was placed the pr nirvana statue of Buddha in Stucco. On the plinth and sides of the stairs of the main stupa at Zar Dheri were found the pilasters attached to the plinth. In Zar Dheri, the stone element of very simple and highly abstract form derived from a lion seat or vegetal motif is used. In Bhamala, pair of lions was found at the east and west stairs and pair of elephants were on the south and north. As for as stairs and the plinth are concerned, the stupa at Bhamala shows a more complex and elaborate design as compare to that of Zar Dheri Stupa. In Zar Dheri all the structures including the monastery are constructed in diaper masonry, while at Bhamala the structures are made in Semi Ashlar masonry (*Zar Dheri Archaeological Excavation of an Ancient Buddhist Site in Pakistan : 391-392*).

The evidences of cross planned stupa have also been reported at Sahri Bahlol, a Buddhist complex located about two and a half km to the southwest of Takht-i-Bahi in district Mardan. The site has been surveyed by the renown archaeologists including A. Cunningham, D.B Spooner and then by Stein during the late 19th and early 20th centuries (Report 1873, *A.S.A.I.R.*, 1906-07, 1909-10, 1911-12). Aurel Stein conducted excavation at the site in 1911 and reported a cross-planned stupa at mound G. The stupa although was not in a better state of preservation, yet the foundation of stone wall of diaper masonry give enough clues about its cruciform shape of the stupa having close resemblance with that excavated at Rawak in Khotan in 1901 (*A.S.I.* 1909-10:25-27)

Another example of cruciform stupa was reported by D.B Spooner during the excavation conducted at Shah-ji-ki-Dheri in 1907-08 (A.S.I. 1909-10:25-27). According to Kuwayama, the plan of the stupa was changed twice before the cross-plan was finally adopted around AD 560-630. But no traces of this stupa are left now for comparison (Kuwayama 1995: 354; 2002: 71).

Stein also reported the evidences of cruciform stupa at Rawak located in Khotan region of China where he carried out archaeological explorations and excavations between 1900-1. During the field investigations, Stein reported the presence of a cross-planned stupa at the site. The stupa was made of bricks and was provided with cruciform foundation over which the square plinth was added, the circular drum and dome were placed over the square plinth respectively. Like Bhamala stupa, the Rawak stupa was also provided with four staircases one on each side (*Zar Dheri Archaeological Excavation of an Ancient Buddhist Site in Pakistan: 391-392*).

Another example of the cross-planned stupa has recently been exposed on the western site of the main stupa on the back side of the Parinirvana chamber at Bhamala. The newly exposed stupa is not in a good state of preservation as the dome, drum and the southern side of the stupa were found missing due to the illegal operations by the antiquarians. However northern side of the said stupa below the drum gives sufficient intimations about its shape. The newly exposed stupa is provided with chapels on the eastern side. The stupa is not yet been exposed completely. Further investigations at the site will bring into light more information about its size and decorative elements.

The main stupa is surrounded by a total of 19 votive stupas with square bases made of stone mostly in semi ashlar and occasionally in ashlar masonry with kanjure stone facing. Sir John Marshall has placed these minor stupas to the 4th or 5th century AD on the basis of coins and similarities to that of Dharmarajika (Marshall 2007: 174).

The monastic establishments were exposed on the eastern side of the Main Stupa during the first excavation. The courtyard in which the stupa stood is 7 feet higher than the monastery on the east. Access to the stupa from the eastern side was approached by a wide flight of nine steps leading up to a gateway. The monastery is built on usual plan with a large court of cells in front and the kitchen, assembly hall and refectory in the rear. Sir John Marshall has mentioned the two exceptional features i.e. the western side of the court of cells large than usual and the two additional cell provided at the corner of the veranda. Another exceptional feature is that the stairs leading to the upper story were located in the kitchen instead of in one of the cell thus making it inconvenient for the monks who had to pass through the kitchen while going to their chambers. All the structures in the monastery area are made of dressed stone in semi ashlar masonry (*ASI 1930-34:156*). Sign of striking are visible on the dressed blocks. The striking was done most probably to prepare the blocks for applying plaster.

The pavement of the stupa court was composed for the most part of rectangular terracotta tiles, which were covered at later date with a coating of lime plaster having close resemblance with that of Shah-ji-ki Dheri, where the stupa was surrounded by brick pavement (*ASI 1908-09: 48,58*). To secure them in position they were divided into squares, and lines of tiles-on-edge lay between.

### **Major Antiquities reported by Sir John Marshall from Bhamala**

Apart from the structures, a large number of archaeological artifacts were also reported from Bhamala during the 1st excavation which stucco sculpture fragment, copper coins, relic casket with bones, beads of different materials including glass, agate and coral etc. In addition, a gold ornament, and large number of potsherds were also collected during the process of excavation. But the most important of all was the parinirvana statue of Buddha in stucco reported from the main stupa (*ASI* 1930-34: 155). The antiquities reported during the first excavation are now exhibited in Taxila Museum.

After Sir John Marshall, no major field investigations were carried out at the site for almost 81 years. In 2012-13 excavation was resumed at the site by the Department of Archaeology, Hazara University, Mansehra in collaboration with the University of Wisconsin (USA) under the supervision of the senior author.



Fig. 3: General View of the Cruciform Stupa from the southern side



Fig. 4: Bhamala Excavations 2012-13: A view of Chakra from the southern side

### Religious Significance of the Cruciform Architecture

The cross-plan is said to have used only for representational buildings, commissioned by supreme imperial and local rulers. The four-lawn was a power statement, rediscovered by the subsequent rulers who wanted to relate their power to the previous chief patrons. The four-lawn plan has been discussed to trace the origin by Elena Paskaleva who has rejected the theories regarding the four-plan associated strictly to the Islamic phenomenon. The approach offers the comparative analysis with Buddhist and Hindu cross-axial monuments (Paskaleva 2012: 36-37).

The basic concept of four elements can be found in all mythologies and religions of the world. The most prominent representations are related to the four cardinal points: The Cosmic Cross and its cosmic centre. In mythological thought, the concept of four can be found in the representations of the four winds, the four seasons, the four elements, the four humours of the human body, the four giants holding the world, etc. In the polytheist thought, the concept of four can be seen in representation of the four major deities plus one supreme central deity, the four casts and the four Vedas etc. while in the monotheistic thought, the concept of four developed further as a representation of the four evangelists (Christianity), four pillars (angles) holding the Throne of God (Islam). The four rivers of Paradise are mentioned in the Quran as well as in the old testaments (Sura 47: 15; Genesis 2:10), the four animalia and the four major prophets. There are four evangelists and four Gospels that spread across the world, the four *mysteria Christi*, the four cardinal virtues and the vision of the Throned Being aimed the four living creation are mentioned in the New Testament (Revelation 4). This concept of four also remained unchanged in Sufism (Islam). In Sufi cosmology the fortification of the four world directions has cosmic dimension, whereas the four spiritual masters (*Awtad*, "Pegs") are related to east, west, north and south.

The concept of four acquired special representations based on a symmetrical grid used for centuries in the region. The origins of such grid can be traced down to Plato (in the west) with his cosmological dialogue *Timaeus*, one of his best known works in early Islam) and the mandala (in the East). The concept of four geometrically transformed in the Cosmic Cross, was adopted in the construction of quadripartite cities, palaces, Buddhist stupas, Hindu temples, Christian churches, Islamic mosques, madrassas, tombs, khanaqahs and gardens etc. The sanctuaries can be classified into two groups. Of these, the first category comprises of buildings with centrally organized, square sanctuaries with wall openings along the cardinal points (e.g. the Buddhist Vihara or stupa). While the second category comprises of buildings provided with square sanctuaries, situated in a rectangular courtyard (e.g. the Gupta Temple) (Paskaleva 2012: 37-38).

So it is clear from the above discussion that the concept of four has a religious significance which has been represented in the architecture since long. The cruciform shape buildings are thus attributed to the supreme rulers. The Bhamala stupa being one of the earliest examples bears an exceptional architectural value. Such type of architecture was later on further developed during 7<sup>th</sup> -8<sup>th</sup> century AD (e.g. the Buddhist monastery at Adzhina Tepa in the present day Tajikistan) and the same style was later on adapted by the Muslims to construct their mosques, madrassas, tombs and Khanqahs.

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ZarDheri Archaeological Excavation of an Ancient Buddhist Site, Tokyo National Museum Archaeological Mission to Pakistan

## Preliminary Report of Bhamala Excavations (2012-13)

**Abdul Samad, Mark Kenoyer, Abdul Hameed and Shakirullah**

*Abstract:*

*After 1930-31 when the first ever archaeological excavations were conducted at Bhamala by Sir John Marshall, no serious efforts were ever made to undertake major researches in larger Taxila Valley in general and the important Bhamala Buddhist site in particular. Keeping in view the archaeological potential of Bhamala, the Department of Archaeology Hazara University, Mansehra resumed the field investigation in collaboration with the Department of Anthropology, University of Wisconsin Madison (USA) at the site in 2012-13. The aims of this excavation included re-analyses the previous archaeological investigations, application of the latest excavation techniques for precise documentation, to re-confirm the dates already given to the site, to reconstruct the history of the site on scientific basis, and to enhance the capacity of the teachers and students of archaeology. This paper include the results of the season's excavations at the site.*

**Key words:** Bhamala, Sir John Marshall, Taxila, Buddhist site, Stupa, Parinirvan.

### **Introduction:**

Keeping in view the archaeological potential of Bhamala, the Department of Archaeology Hazara University, Mansehra resumed the field investigation at the site in 2012-13. The excavation was carried out in collaboration with the Department of Anthropology, University of Wisconsin Madison (USA) under a joint project Archaeological Research and Conservation in Taxila 2012-14 (ARCIP), funded by US Embassy in Pakistan.

### **Aims and objectives of the Excavation**

The chief aims of this excavation were:

- To reanalyses the previous archaeological investigations conducted at the site
- To apply the latest excavation techniques for precise documentation
- To reconfirm the dates already given to the site
- To reconstruct the history of the site on scientific basis
- To enhance the capacity of the staff and students

### **Methodology**

In the traditional Wheeler Technique more focus is given to the artifacts and the architectural remains are not given much importance. As precise documentation of both artifacts and features was one of the main aims of the excavation, therefore, it was decided to apply Harix Matrix Technique. For this purpose the site was divided into the following eight major areas (Fig. 1 & 2).

**Area A:** The unexcavated portion of the site to the western side of the main stupa

**Area B:** The unexcavated area to the southern side of the main stupa and the monastery

**Area C:** The main stupa and the court containing votive stupas and the chapels

**Area D:** The unexcavated portion to the southern side of the main stupa

**Area E:** The area between the main stupa and the monastery

**Area G:** The main monastery

**Area H:** Area to the northern side of the monastery

**Area J:** The unexcavated Area to the eastern side of the monastery

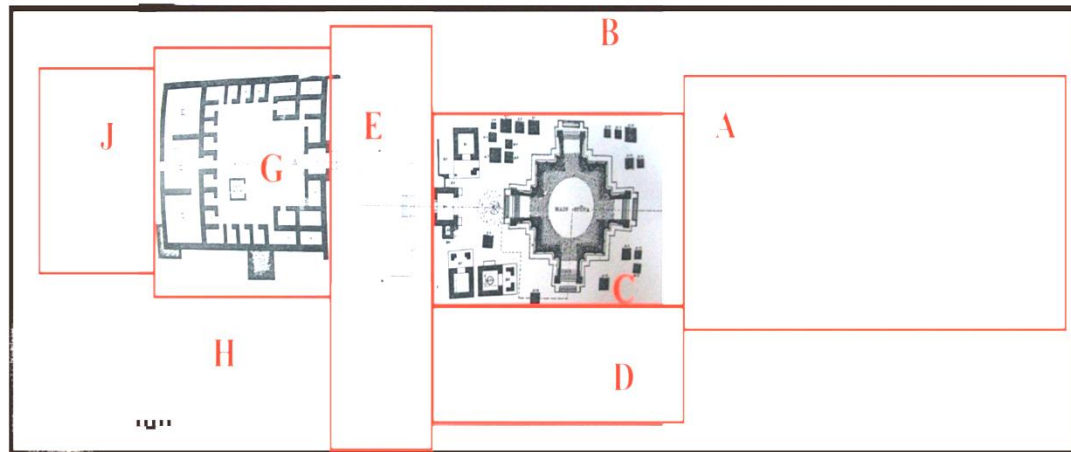


Figure 1. Bhamala Excavations 2012-13: Division of the sites into eight major areas



Figure 1. Bhamala Excavations 2012-13: Division of the sites into eight major areas

### Layout of Trenches

In 2013-14 A total of 13 trenches were selected for excavation in four different areas i.e. A, C, G and J.

Area A (Fig. 3) : Four trenches (Fig. 4) were opened in this area which include A/I, A/II, A/III & A/IV each measuring 5x5 meter with a one meter balk between them. All these trenches were laid in the area located to the west of the main stupa, where the remains of parinirvana statue were reported during the later excavation. This area was left unexcavated by Sir John Marshall. According to Sir John Marshall this area did not was not suitable for excavation (Marshall 2007: 171; ASI 1930-34: 53). But Sir John Marshall has not given the reasons. It can be presumed that whether this area was either disturbed by antiquarians before the first excavation carried out at the site or was partially excavated by Sir John Marshall.

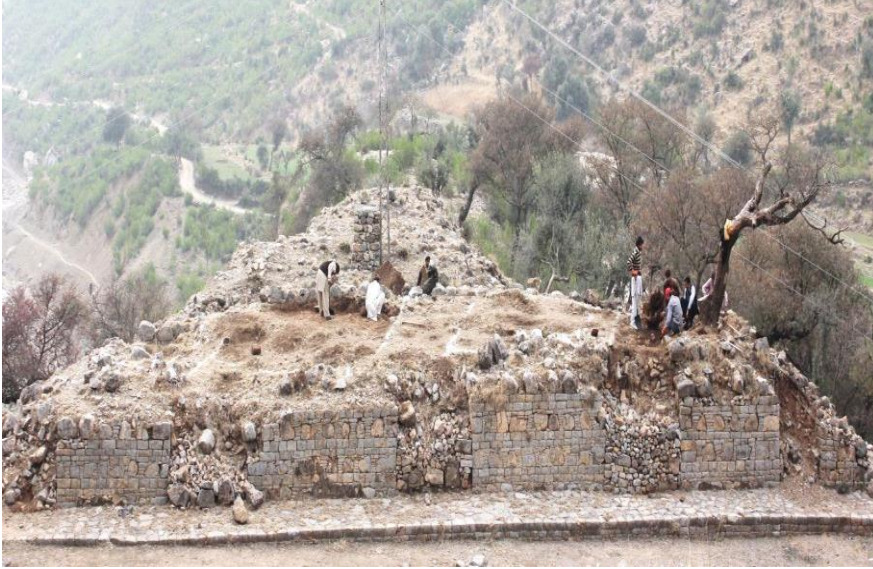


Figure 3. Bhamala Excavations 2012-13: Area A, the unexcavated area to the west of the main stupa



Figure 4. Bhamala Excavations 2012-13: General view of trenches in Area A from the Northern side

Area C: In this area a total of six trenches were laid for excavation. These trenches were of different in size. Of these C/I measuring 10x10 meters & C/II (Fig. 5) 2.5x2.5 meter were laid on the eastern side of the main stupa; while C/III (Fig. 6) & C/IV each measuring 5x5 meter were laid on the southwestern side of the main stupa and the last two i.e. C/V & C/VI (Fig.7) each measuring 4x4 meter were opened on the eastern top of the main stupa.



Figure 5. Bhamala Excavations 2012-13: General view of C/I & C/II from the western side

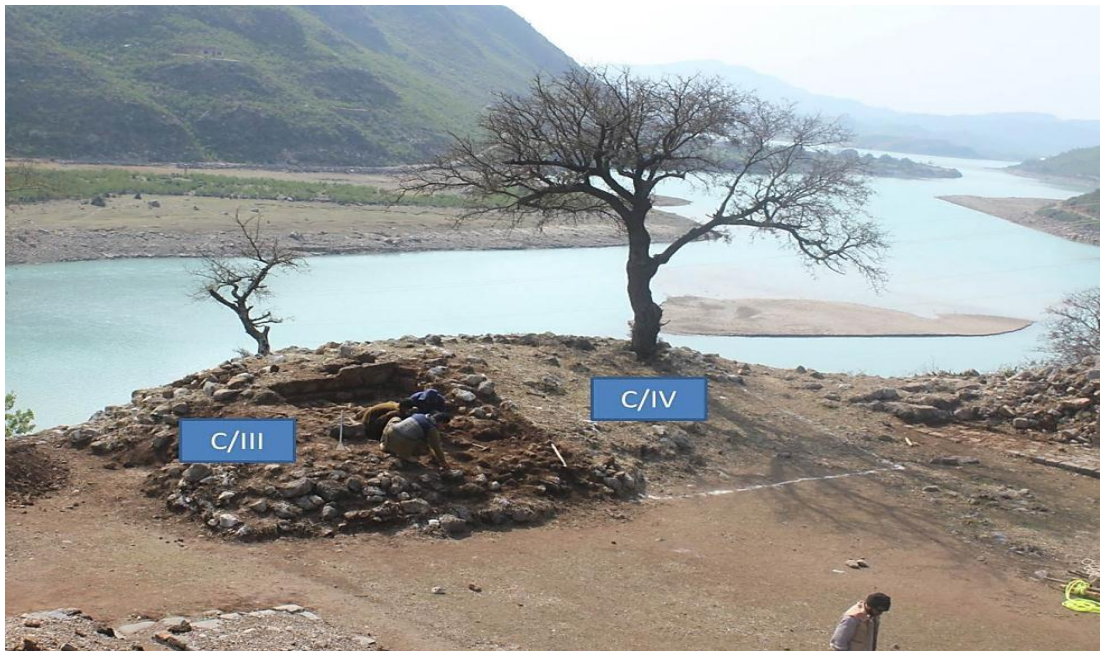


Figure 6. Bhamala Excavations 2012-13: General view of C/III & C/IV from the Northern side

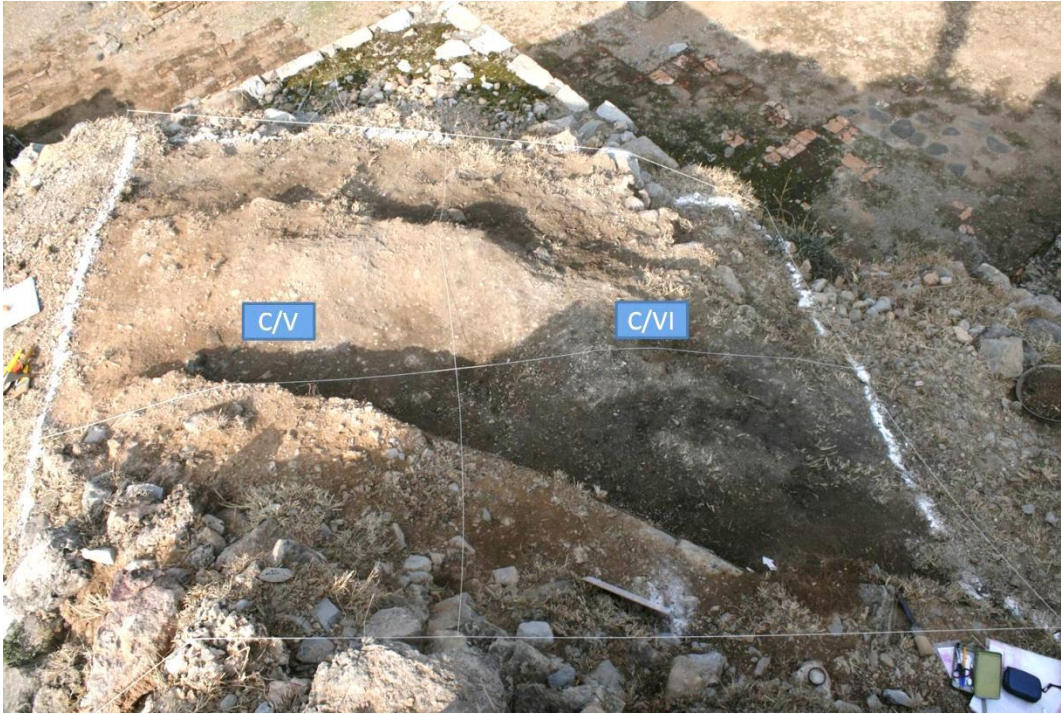


Figure 7. Bhamala Excavations 2012-13: General view of C/V & C/VI from the Southern side

Area G: The excavations conducted by Sir John Marshall revealed a well-built monastery on the east almost at the same pattern as built at Jaulian (Dani 1999:149). The monastery area was given the alphabetical number G. A single Cell was selected for excavation in the main monastery area. It was allotted trench number i.e. G/I (Fig. 8). The trench measured 4x4 meter. No major finding were revealed from the said during the process of excavation.



Figure 8. Bhamala Excavations 2012-13: General view of G/I from the Southern side

Area J: In this area only two trenches i.e. J/I & J/II (Fig.9) each measuring 3.5x3.5 were laid with the purpose to know about the vertical profile of the site.



Figure 9. Bhamala Excavations 2012-13: General view of J/I & J/II from the western side

### **Major Structural Remains Exposed**

Very few structural remains were revealed during the excavation which include the western, northern and southern walls of the parinirvana chamber were partially exposed in trench A/I, A/II, A/III & A/IV. Like the rest of the structures the parinirvana chamber is also made of dressed stone blocks in semi ashlar masonry. Access to the chamber is provided on the eastern through three openings.

Another structural remain exposed was the Dharmachakra which was refilled by John Marshall after excavation (ASI 1930-34:155) to the eastern side of the main stupa in trench C/I. The Chakra is made of terracotta tiles placed in vertical and horizontal positions. The chakra is provided with passages from the northern, eastern and southern sides.

Excavations carried out in C/IV & V revealed wall structures of an unidentified building having no entrance. These structures are also made in the same masonry while portion of drum e, were reported in trench nos. C/V & C/VI. The wall structures of an identified building in C/III & C/IV.

In area J a covered drain was exposed during the process of excavation. The drain is made of dressed stone blocks and covered with stone slabs. The outlet of the drain is on the eastern side and it was a made to throw off wastes of the kitchen. In addition, a cell was opened inside the monastery in G/I. The cell was partially

excavated by Sir John Marshall. It is located on the north western corner of the monastery made of the dressed stone blocks in semi ashlar masonry like the rest of the cells. It is provided with a small nich on the western wall.

### **Major Findings unearthed during the excavation**

The under discussion excavation revealed a number of archaeological artifacts made of different materials i.e. Terracotta, stucco, laminated steel/Iron, copper and stone etc.

A total of 33 terracotta objects were unearthed which include fragments of heads, two of them are recognizable (Fig. 10 & 11), one being of Bodhisattva, and the other one is a female head while the rest are not determinable. The terracotta busts reported during the excavation include two female busts (Fig. 12 & 13) with prominent breasts. A broken bust of Bodhisattva (Fig.14) wearing jewellery was also reported during the process of investigations. The finger fragments are comprised of one thumb and four little fingers; while the remaining not determinable. In addition, a terracotta tile with swastika design (Fig.15) was also reported. The court yard of the main stupa was found paved with such tiles having similarities with that of Shah-ji-ki-Dheri (ASI 2012: 58). All the terracotta objects excluding the potsherds and tile were reported from the parinirvana chamber.



Figure 10. Bhamala Excavations 2012-13: Terracotta head of Bodhisattva



Figure 11. Bhamala Excavations 2012-13: Terracotta female head



Figure 12 and Figure 13. Bhamala Excavations 2012-13: Terracotta Busts of female



Figure 14. Bhamala Excavations 2012-13: Terracotta Bust of Bodhisattva



Figure 15. Bhamala Excavations 2012-13: Terracotta Tile decorated with Swastika design

A total of five stucco objects were unearthed during the process of excavation C/V & C/VI laid on the eastern top of the main stupa. Three of them are fragments of lotus flowers and the other two are fragments of architectural elements. The objects made of laminated steel reported during the excavation include nails, fragments door fitting and knives. While the iron objects include nails and chisel. The copper objects unearthed during the process of excavation include six rusted coins, two rods and 14 miscellaneous objects. And the last category comprises of five miscellaneous stone objects. But the most important finding was the carnelian seal (Fig. 16) depicted with Gaja Lakshmi and a child flanked by two elephants on top, one on either side.



Figure 16. Bhamala Excavations 2012-13: Carnelian seal depicted with Gaja Lakshmi

## Catalogue of the Antiquities

Registration No	Lot No.	Feature No.	Trench No.	Object	Material	3DM in (cm)	Description	Condition	Size in (cm)
BML_0001	421	01	C/I	Seal	Carnelian	E: 94 N :34 D: 1cm	A carnelian Seal depicted with goddess, a child and two elephants on top one on each side	Good	L:1.3cm W:1.1 cm Br: 0.2 cm
BML_0002	701	01	J/I	Nail	Iron	E:40 S:140 D:4 cm	Iron nail with round head	Rusted	L: 11.2cm Dia:2.3 Br:0.8 cm
BML_0003	701	01	J/I	Nail	Iron	N:50 E:70 D:4 cm	Iron nail bent from one end	Rusted	L: 10cm Dia:1.5 Br:0.5cm
BML_0004		09	C/I	Miscellaneous	Copper	N:335 E:88 D:10 cm	A Copper Piece	Rusted	L: 2.3 cm W:1.8
BML_0005		07	C/I	Miscellaneous	Copper	W:380 S:350 D :8cm	An unidentified Copper object	Rusted	L: 1 cm W:0.5
BML_0006		13	C/I	Nail	Iron	N:120 E:200 D:10cm	An Iron Nail (head missing)	Rusted	L: 6cm W:0.9 cm
BML_0007		01	Surface collection	Miscellaneous	Iron	Found on the south-western side of the main stupa	An Iron Slag	Rusted	L: 3.6cm W:2 cm
BML_0008		01	C/II	Nail	Iron	E:200 N:0.5 cm D:7cm	An Iron Nail (head missing)	Rusted	L: 6.4 cm W:0.4 cm
BML_0009		06	J/I	Miscellaneous	Stone	N:20 E:50 D:70cm	An unidentified stone object?	Slightly chipped off	L: 8cm W:3.9 cm

BML_0010		01	Surface collection	Miscellaneous	Copper	Surface collection	A copper piece	Rusted	L: 2.5cm W:0.5cm
BML_0011		08	C/I,	Tile	T/C	N: 40 cm W:310 cm D: 11cm	A terracotta tile decorated with swastika design	Good	L: 14 cm W:13.6 cm Br: 2.1 cm
BML_0012		03	A/I	Chisel	Iron	S: 225 cm W:120 cm D: 55 cm	An Iron chisel oblong in shape	Good	L: 25 cm W:3 cm Br: 1.4 cm
BML_0013		03	C/V	Capital	Stucco	S: 20 cm W:120 cm D: 10 cm	Stucco Architectural element (Capital)	Damaged	L: 7.3 cm W:5.6cm
BML_0014		02	A/III	Miscellaneous	T/C	N: 50 cm E:90 cm D: 55 cm	Terracotta broken part of figurine?	Damaged	L: 5.5 cm W:3.9cm
BML_0015		03	C/II	Coin	Copper	S: 153 cm W:130 cm D: 6 cm	A piece of Copper coin	Rusted	L: 1 cm W:0.7 cm
BML_0016		03	C/II	Knife Blade	Iron	S: 150 cm W:130 cm D: 9 cm	An Iron blade of a knife	Rusted	L: 1 2 cm W:1.3 cm Br: 0.2
BML_0017		03	C/II	Nail	Iron	S: 10 cm W:230 cm D: 4 cm	An Iron Nail	Rusted	L: 6.5 cm W:0.4 cm
BML_0018		01		Coin	Copper	Surface Collection	A Copper coin	Rusted	L: 2.5 cm W:2 cm
BML_0019		01		Coin	Copper	Surface Collection	A Copper Coin	Rusted	L: 1 2 cm W:0.8cm
BML_0020		01	Surface	Miscellaneous	Iron	Surface Collection	A Pointed Iron Object	Rusted	L: 6.6 cm W:0.6 cm 0.2
BML_0021		03	A/I	Sculpture	T/C	N:210 cm W:90 cm D: 130 cm	A broken thumb of human figure	Broken	L: 2.3 cm W:1.cm

BML_0022		04	A/I,	Nail	Iron	S: 230cm W:210 cm D: 144 cm	An Iron Nail, head missing	Rusted	L: 7.4 cm Dia: 0.8 cm
BML_0023		05	A/I,	Nail	Iron	S: 110 cm W:130 cm D: 142cm	An Iron Nail, Bent from the Top	Rusted	L: 14 cm W:2.3 cm
BML_0024		02	C/V	Decorative Motive	Stucco	N: 64 cm E:170 cm D: 110 cm	A Fragment of stucco probably a lotus flower	Rusted	L: 7.5 cm W:7.4 cm Br: 4.1
BML_0025		02	C/V	Nail	Iron	N: 70 cm E:170 cm D: 122 cm	An Iron Nail; head missing	Rusted	L: 4.5 cm W:0.8 cm
BML_0026		02	C/V	Nail	Iron	S: 75 cm E:70 cm D: 110 cm	An Iron Nail; head missing	Rusted	L: 4.8 cm W:0.8 cm
BML_0027		03	A/II	Sculpture	T/C	N: 90 cm E:210 cm	Terracotta fragment of human figure (Face with left eye)	Broken	L: 11.8 cm W:6.7 cm Br. 2.5cm
BML_0028		01	Surface Collection	Coins	Copper	Surface Collection	Copper coins (05 in nos.)	Rusted	Dia: 0.5 cm
BML_0029		02	C/V	Nail	Iron	Sieving	An Iron Nail; bent from the top	Rusted	L: 7.5 cm W:0.8 cm
BML_0030		06	A/II	Miscellane ous	T/C	N: 10 cm E:110 cm D: 260 cm	Terracotta fragment with applied design (Circle)	Broken	L: 4.5 cm W:3.5 cm
BML_0031		06	A/II	Sculpture	T/C	S: 50 cm E:150 cm	Terracotta fragment of a figure	Broken	L: 10 cm W:4 cm
BML_0032		03	A/II	Sculpture	T/C	N: 50 cm E:130 cm D: 30 cm	Terracotta fragment of Sculpture (right Ear)	Broken	L: 8.5 cm W:6 cm
BML_0033		01	Surface Collection	Architectur al Element	Stucco	On the western side of the Main Stupa	Stucco Architectural Element (Capital)	Broken	L: 6 cm W:7.5 cm

BML_0034		01	Surface Collection	Seal	Stone?	Found from the stupa area	A Tiny Seal depicted	Good	Dia: 0.4 cm
BML_0035		01	C/V	Nail	Iron	On the western side of the Main Stupa	E: 90 cm S: 110 cm	Rusted	L: 6 cm W: 2 cm
BML_0036		10	A/III	Nail	Iron	N: 50 cm W: 110 cm	Head of an Iron Nail	Rusted and Broken	Dia: 4 cm
BML_0037		01	C/V	Miscellaneous	Iron	S: 150 cm W: 200 cm D: 634.32 metre from D.P	An Iron broken object with hole in the centre	Rusted	L: 4.5 cm W: 4 cm Dia of the hole: 1.5 cm
BML_0038		01	C/V	Miscellaneous	Metal?	Sieving	A Metal object with minor particles on it	Broken	L: 2.5 cm W: 1 cm
BML_0039		01	C/V	Miscellaneous	Copper	Sieving	A Copper object with a hole in the centre	Broken	L: 5.5 cm W: 1.5 cm
BML_0040		01	C/VI	Miscellaneous	Stone	E: 60 cm N: 150 cm D: 634.33 metres from D.P	A stone object (Probably base of a pot?)	Broken	L: 8.5 cm W: 5 cm
BML_0041		01	Surface Collection	Miscellaneous	Stone Object	Main Stupa	A Stone object (Probably a seal?)	Broken	L: 0.5 cm W: 0.3 cm
BML_0042		02	C/V	Miscellaneous	Metal?	Sieving	A metal object with smooth surface black in colour	Broken	L: 2.2 cm W: 1.9 cm
BML_0043		04	G/I	Nail	Copper	E: 70 cm S: 30 cm D: 627.34 metres from D.P	A copper, pointed end missing	Broken	L: 6 cm W: 6.5 cm

BML_0044		03	C/VI	Decorative motive	Stucco	N: 190 cm E: 200 cm D: 90 cm	Stucco decorative element (Lotus Flower)	Broken	L: 3.8 cm W: 4 cm
BML_0045		12	G/I	Blade	Iron	Recovered from the Nitch	An Iron object probably blade of a knife	Rusted	L:5.4 cm W: 1.5 cm
BML_0046		01	Surface Collection	Miscellaneous	Stone	Recovered from the top of votive stupa 15	A stone object Probably a seal	Good	Dia: 1 cm
BML_0047		19	A/I	Hook	Iron	E: 10 cm S: 130 cm D: 630.91 metres from D.P	Iron Door Hook	Rusted	L:10.1 cm W: 4.7 cm
BML_0048		02	A/III	Sculpture	T/C	E: 130 cm S:237 cm D: 100 cm from the surface	Terracotta fragment of human figure (Hair)	Broken	L:4.5 cm W: 4 cm
BML_0049		03	C/VI	Miscellaneous	Copper	N: 110cm E:60 cm D: 120 cm from the surface	A Copper Object?	Broken and rusted	L:4.2 cm W: 1.7 cm
BML_0050		03	C/V	Miscellaneous	Copper	E: 80 cm S:70 cm D: 110 cm from the surface	An oblong shape copper object	Rusted	L:3 cm W: 1.3 cm
BML_0051		02	C/V	Architectural Element	Stucco	W: 40 cm N:70 cm D: 90 cm from the surface	Stucco d architectural element (Lotus Flower)	Broken	L:4.2 cm W: 4.7cm

BML_0052		08	A/II	Sculpture	T/C	N: 120 cm W:200 cm D: 107 cm from the surface	Terracotta fragment of human figure probably (Hair)	Broken	L:7.5 cm W: 5 cm
BML_0053		03	C/V	Miscellaneous	Copper	W: 10 cm N:40cm D: 90 cm from the surface	A copper object	Broken and rusted	L:5.2 cm W: 2 cm
BML_0054		01	Surface Collection	Miscellaneous	Copper	Recovered from the top of the votive stupa to the southern side of main stupa	Copper Objects two in nos gold wash. (probably coins)	Rusted	L:1.3 cm W: 1cm
BML_0055		12	A/III, 369	Sculpture	T/C	E: 150 cm N:40 cm D: 83 cm from the surface	Terracotta head of Bodhisattva with half opened eyes, hair cut off, eyes broken and forehead on the left chipped off	Broken	L:16 cm W: 12.5 cm
BML_0056		13	A/III	Sculpture	T/C	W: 260 cm N:85 cm D: 174 cm from the surface	Head of an unknown figure with half opened eyes; nose chipped off rare head broken and missing	Broken and damaged	L:12 cm W: 8.5 cm
BML_0057		16	A/III	Sculpture	T/C	E: 150 cm N:150 cm D: 208 cm from the surface	Terracotta fragment of human figure with half opened eye, comprising of forehead, cheek nose and chin (probably Buddha)	Broken	L:12.5 cm W: 9 cm
BML_0058		14	A/III	Sculpture	T/C	N: 200 cm E:120 cm D: 100 cm from the surface	Terracotta face of human figure nose lips and moustache	Damaged, Broken and chipped off	L:5.5 cm W: 4.5 cm

BML_0059		16	A/III	Architectural element	T/C	E: 180 cm N:150 cm D: 130 cm from the surface	Terracotta pedestal with applied design	Broken	L:9 cm W: 8 cm
BML_0060		13	A/II	Rod	Iron	E: 70 cm S:30 cm D: 160 cm from the surface	An Iron Rod	Rusted	L:30 cm W: 1.8 cm
BML_0061		13	A/III	Sculpture	T/C	W: 286 cm N:88 cm D: 190 cm from the surface	Terracotta object probably part of sculpture	Broken	L:8 cm W: 7 cm
BML_0062		13	A/III	Sculpture	T/C	S: 80 cm E:240 cm D: 174 cm from the surface	Terracotta bust of female figure; right breast prominent	Broken	L:16 cm W: 14 cm
BML_0063		13	A/II	Sculpture	T/C	E: 130 cm N:230 cm D: 160 cm from the surface	Terracotta bust of bejewelled Bodhisattva	Damaged and broken	L:30 cm W: 19 cm
BML_0064		13	A/III	Sculpture	T/C	E: 120 cm S:160 cm D: 140 cm from the surface	Terracotta bust of a female figure with prominent breasts	Broken	L:17 cm W: 16 cm
BML_0065		13	A/III	Sculpture	T/C	W: 260 cm N:85 cm D: 174 cm from the surface	Terracotta fragment of drapery	Broken	L:15 cm W: 10 cm
BML_0066		13	A/III	Sculpture	T/C	W: 85 cm N:260 cm	Terracotta fragment of human figure; only chin, lips and cheek preserved	Broken and chipped off	L:11 cm W: 7.5 cm

						D: 174 cm from the surface			
BML_0067		14	A/III, 371	Sculpture	T/C	W:419 cm  N:230 cm  D: 206 cm from the surface	Terracotta part of sculpture Fingers (02 in nos.)	Good	L:0.5 cm  W: 1.5cm
BML_0068		13	A/III	Sculpture	T/C	S: 150 cm  E:150 cm  D: 200 cm from the surface	Terracotta part of sculpture probably bust with applied design	Damaged and	L:13 cm  W: 9 cm
BML_0069		14	A/III	Sculpture	T/C	S: 250 cm  E:80 cm  D: 214 cm from the surface	Terracotta fingers (08 in nos.)	Broken	L:4.7 cm  W: 2 cm
BML_0070		17	A/I	Nail	Iron	E: 90 cm  S:90 cm  D: 200 cm from the surface	An Iron Nail, head broken	Broken and rusted	L:8.5 cm  W: 1.5cm
BML_0071		14	A/II	Miscellaneous	T/C	E: 210 cm  S:130 cm  D: 136 cm from the surface	Terracotta object decorated with circle	Good	Dia: 4.4 cm
BML_007		14	G/I	Coin?	Copper	E: 250 cm  N:100 cm	A copper piece	rusted	L:1 cm  W: 0.8 cm
BML_0073		13	A/III	Pot	T/C	E: 100 cm  S:180 cm  D: 207 cm from the surface	Terracotta Tiny pot	Slightly broken	Dia:4.5 cm  H: 3 cm

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# The Art and Architecture of Taxila

Muhammad Ilyas Bhatti

## Abstract:

*This research paper characterizes the organization and function of the Buddhist religious architecture in the public sacred areas as well as in the monasteries. While the main focus is on structural features, sculptures are also addressed in terms of its integration and use in these devotional settings. In this sense, the sculptures provide evidence for interpreting how various structures functioned, and provide insight into how people moved within these sites. Reciprocally, the architectural evidence contributes greatly to our understanding of how sculptures were used, and provide clues as to why these patterns changed through time. The two variables taken into consideration are the radical transformations Buddhism underwent between the 2nd century BCE and the 8th century CE and the considerable regional variation that seems to have occurred. By using architectural evidence, numismatic data, masonry systems, and structural remains, the buildings were constructed on top of or against one another; it is possible to document periodic patterns and to determine a clear sequence for structural types used in Gandhara and Taxila sacred areas and monasteries. The establishment of a chronological framework based on architecture also provides a means of understanding Gandhara art in its original context. While it is usually impossible to say where a given sculpture might have been located, it is feasible to establish patterns of image placement and to group images into common types. This categorization of the imagery into units that fall into a relative sequence is vital for interpreting architectural data at sites where sculpture was recovered, but numismatic or masonry evidence is not available..*

**Key words:** Taxila, temples of Buddhism, art, architecture, stupa, monastery, Jaulian, Mohra Muradu, Gandhara, sculpture, Sirkap,

## Introduction:

The earliest temples of Buddhism were buildings of wood and thatch erected when the demand arose for actual shrines to enclose some cult object, such as a memorial stupa, to concentrate the worship of the Buddha's followers on some material reminder or symbol of his earthly mission. Prior to this, the services had been conducted in the open air, in groves or a forest clearing, such as the Buddha was wont to select for gatherings of his disciples. These earliest structural buildings of Buddhism have, of course, disappeared, but we can get a very clear impression of their appearance from the sculptural replicas of such edifices as began to be carved from the living rock in various parts of Gandhara as early as the Maurya Period. These are the so-called cave temples of western India. The word 'cave' is actually rather misleading, since it implies a natural grotto that is the home of wild beasts or savages, whereas these entirely man made recesses are among the most sophisticated examples of religious art in all Indian history. 'Rock-cut sanctuaries' is a better definition for these enormous halls of worship hewn from the rock in imitation of freestanding architectural types. The definition, chaitya-hall, sometimes applied to these monuments, is derived from the word chaitya, which refers to any holy place.

The rock-cut temples are only the most ambitious examples of the development of monumental stone-carving that followed on the invasion of Alexander the Great and the re-establishment of relations with western Asia. In the subcontinent, there was probably already the idea of preserving the Buddha's Law through the bad times at the end of the kalpa. Such grotto/cave sanctuaries appealed to the early Buddhists through their association with caves that even in Vedic times had formed the abodes of hermits and rishis. The development of the religion from the isolated practice of asceticism to the formation of a monastic organization required the enlargement of

the single rock-cut cell provided for the retreat of holy men by Aśoka to the monumental rock-cut assembly halls that we find in western India.

The stucco sculptures from various sites in the Taxila Valley are the pride of Taxila. A great number of these sculptures are dated by Marshall in the 4th – 5th century CE. This has led him to advocate his theory of two separate and successive schools of art in Gandhara with a gap of more than one hundred years in between – both distinct from each other in material as well as in distribution in space and time. The recent archaeological investigation in Dir area has clearly shown that stucco and terracotta sculptures mark the final stage of most of the Buddhist monasteries. What cannot, as yet, be proved is the time-gap between the two schools as proposed by Sir John Marshall. As a matter of fact both the stone and stucco sculptures always existed side by side though gradually stucco became more and more popular. This is particularly true at Taxila. Over one thousand of these stucco sculptures came from one single site of Jaulian all ranging from tiny figures to giant statues up to 13 feet high.

### **Methodology**

The narrative stone sculptures, decorative reliefs, or images of Gandhara are an important tool with the help of which an attempt has been made to understand the various aspects of the Kushan's multi-ethnic blend of many cultures, history, architecture, and religion. Gandharan studies in general and studies of Gandhara art in particular have traditionally been, and continue to be, dominated by archaeologists and art historians. In fact, until very recently materials falling within the purview of these fields - mainly artistic and archaeological remains, including stone sculpture, inscriptions and coins - were nearly all that we had at our disposal for the study of Gandhara art. Images carved in the sculpture workshops of this ancient realm are among the most expressive and influential in the history of Buddhist art of Gandhara. Scholars have often tried to force the evidence into orderly configurations that fit their own presumption.

### **Results and Discussion**

The development of iconic Buddhist images generally, located in shrines facing the main stupas in the sacred areas. Careful study of the architectural evidence indicates a relative series for shrine construction, both at single sites and across groups of related sites. This archaeological sequence in turn offers a framework for organizing the body of provenance images of Buddhas and bodhisattvas that can be related to the shrines on the basis of scale, material, and means of attachment.

#### **Architectural sequence in Taxila**

Religious development in Taxila started in the 2nd century BCE and continuing to the 6th century CE; a fragmentary record extends the pattern to the 8th century CE. International trade indirectly funded continuous construction of new centers of worship and expansion of existing sites in ancient Taxila, whereas in other parts of south Asia gaps in patronage resulted in an incomplete record of Buddhist architectural and sculptural development—two key sources for understanding ideological change. Until recently, only a few inscriptions and text fragments were known from Taxila, so the architectural and sculptural remains were the best sources of evidence concerning this early culture. The recovery of thousands of manuscript fragments (ca. 1st century-8th century C.E.) will undoubtedly transform the way we understand this active Buddhist community.

Sir John Marshall proposed an architectural chronology based on stratigraphic relationships among the distinct masonry patterns present in his excavations at the sites of Taxila, which he dated using coins. The many coins found at urban and Buddhist sites, especially in stupa relic deposits, help us to determine a sequence. The dating system he developed at the beginning of the 20th century was a major breakthrough. He recognized four major types of masonry: rubble, diaper, semi-ashlar, and a variety of late semi-ashlar. This relative sequence of masonry types can be applied to at least 15 different sites at Taxila excavated between 1912 and 1937. Because the superimposition of masonry is still preserved at many of his excavation sites, this sequence can be corroborated. Although Marshall's broad sequence is fairly well determined, his identifications of chronologic sub-units based on the quality of the fabric in a single masonry type cannot always be accepted. Since Marshall's excavations at Taxila, considerable progress has been made toward a better understanding of the dynastic history of Taxila. The result is a clearer numismatic chronology and a more precise architectural sequence. Establishing an architectural framework for Gandharan sculpture is the key to understanding the changing use of images.

In Taxila (circa late 2nd century BCE to late 1st century CE) the creation of the early Buddhist sacred areas and temples in and around the city of Sirkap and the earliest remains of the Dharmarajika complex, we can characterize the nature of the early Buddhist tradition in the urban context of Sirkap, and in the public parts of the Dharmarajika complex and within the more restricted confines of the early monasteries. The objects found from urban area of Sirkap, mostly produced before the widespread appearance of Buddhist figural art. These finds include luxury items decorated with non-Buddhist themes and terracotta and stone images of popular goddesses. Some of these objects show stylistic similarity with the Indo-Parthian and Hellenistic traditions. Some Buddhist art was being produced at this time, and we cannot rule out the possibility that some of the earliest Buddhist narrative sculpture belongs to this period; this point is highly controversial, however. In this period coins were issued by the Mauryan, Indo-Greek, Indo-Scythian, Indo-Parthian, and other kings. The Kushan coins of King Kujula Kadphises were also evidenced.

The rubble masonry used in Sirkap and in the Dharmarajika complex in Taxila during the period (circa late 2nd century BCE to late 1st century CE) has large irregular, unfinished stones and smaller stones filling the interstitial areas. In contrast to later masonry types, the large stones were not laid in consistent beds, and the small chips placed between larger stones were irregularly organized. The resulting rubble walls were weak and prone to collapse. Marshall postulated that a circa 30 CE earthquake caused extensive damage and led to the adoption of the more stable diaper masonry type, but this assertion cannot be corroborated with other forms of documentation. However, buildings constructed in next period diaper masonry consistently are built on top of rubble structures; diaper was also used to repair rubble walls.

The other important type of masonry is kanjur ashlar. Unlike the rubble masonry, ashlar masonry consists of finely cut rectangular stones that fit tightly together without mortar. It is also found in conjunction with many late monuments, probably because it was the most attractive and expensive type of facing; it may have been used for aesthetic, not structural, reasons. Thus, kanjur ashlar masonry indicates patronage as well as the time period. Ashlar masonry can generally be used at Taxila because of its association with rubble-core structures and certain stylistic forms. Medium-sized square stupas executed in kanjur ashlar masonry, such as those found at Sirkap and in the Dharmarajika complex.

The diaper masonry of period (circa late 2nd century BCE to late 1st century CE) was more labour intensive and hence more expensive than the rubble masonry of the first period, but apparently the greater stability that it provided warranted the expense. Diaper masonry is laid in beds, the main blocks being faced on the wall surface and the underside so that level courses could be created. Tightly fitted between these faced blocks were thin, flat pieces of waste rock. The origin of diaper masonry is not known, but it was used during c. late 2nd century BCE to 5th century CE, outside of the Taxila area. This construction technique can be used to date only monuments in the Taxila area, where it was used for just a short time before the semi-ashlar masonry techniques became popular, such as those of Jaulian or Mohra Moradu.

Because schist is friable, it was very difficult to shape the upper, lower, and exposed faces of the building blocks. Therefore, the most finished part of the block was typically oriented so that the wall surface would be even, at the expense of having ordered, regular beds. The friable nature of the rock also necessitated the use of blocks of varying size. These material limitations curtailed the use of diaper masonry and completely ruled out using the semi-ashlar masonry types. Instead, a sophisticated use of irregular main blocks fitted together with interstitial chips probably paralleled the development of diaper masonry and remained popular until the decline of Buddhism in the area.

The late 1st century CE to early 3rd century CE is the period when many of the existing sacred areas were established. A site such as the Dharmarajika complex was greatly expanded with the addition of stupas, shrines for holy relics, and monasteries; to a great extent, this site can now be regarded as a regional center for the expanding Buddhist institution. The Gandharan religion, which emphasized the worship of relics and utilized the biography of the Buddha, presented in the form of narrative reliefs. Because so many new structures were made-up, it is possible to characterize trends in patronage and recognize ideological interests, observations that can be extended to both the public sphere and the realm of the monastery. Coins of the Great Kushans, including kings Vima Takto, Vima I Kadphises, Kaniska I, and Huviska, date this period.

This period is characterized by a large body of Buddhist-themed narrative sculpture, in which the anthropomorphic image of the Buddha is present. This form of Gandhara art developed as a direct outgrowth of an earlier narrative tradition seen in other places on the Indian subcontinent. However, evidence of the Gandharan practice of recounting large sections of the Buddha's life sequentially in multiple relief panels, to be read in the process of circumambulation. Reconstructing the sculptural embellishment of the small stupas can shed considerable light on the meaning and specific function of the narrative reliefs. These schist reliefs, which emphasize the Buddha's birth, his life in the palace, his enlightenment, scenes of conversion, the moments surrounding his death, and the establishment of his relics, transcend a simple moralistic function; they have more specific kinds of devotional significance.

A shift from diaper masonry to a more sophisticated semi-ashlar technique in the Taxila area can be approximately dated to circa 200 CE. . In the late part double and triple bands of ashlar masonry were sometimes applied to the semi-ashlar constructions. The diaper technique was abandoned in the Taxila area as semi-ashlar came into favour, though a period of overlap must have existed. At Taxila the coins of a single monarch are found in stupas, or coins that were in circulation-that is, those of the reigns of successive kings. Although additional reliquaries were often deposited when stupas were encased, these are usually clearly recognizable.

The numismatic evidence from semi-ashlar stupa relic deposits suggests that this new masonry type had come into use by late 2nd century CE. The appearance of coins of Kaniska I and Huviska from Dharmarajika complex might be taken to indicate that this transition took place slightly earlier, possibly as early as circa 150 C.E. In the semi-ashlar G monastery at Dharmarajika, a hoard of 531 coins of Vasudeva and one of Kaniska I were found in cell 16, another indication that by the time of Vasudeva, semi-ashlar was in use. The continuity of this late masonry type is confirmed by the recovery of 15 Shapur II coins (309-79 CE) in the Dharmarajika N11 stupa and five Kidara (late 4th century CE) coins in the P7 stupa. The latest numismatic evidence that can be associated with the use of semi-ashlar masonry is the extensive coin finds from the Taxila site of Bhamala. This site can be dated on numismatic grounds to at least the late 5th century CE; 285 coins were found as relic deposits in the main stupa, small stupa A5, and small stupa A15.

In the semi-ashlar masonry of Taxila, a layer of large, roughly shaped stones was set on a stable course of brick-shaped rectangular ashlar blocks, and small chips of stones were used to fill the interstitial space to create a level surface for the next ashlar block layer. The earliest semi-ashlar seems closely related to late 1st century CE diaper, as the ashlar layers appear gradually. For example, at Jaulian the main stupa and monastery were constructed using this kind of proto-semi-ashlar masonry, and subsequent repairs were executed in proper semi-ashlar. The main part of development is characterized by the use of well-developed single-course semi-ashlar. The development of stable semi-ashlar masonry can be considered a major technological innovation for this period. Walls could be made thinner and higher, and structures fell less, so repair was needed less often. In addition, because the ashlar courses provided a level surface, the use of larger main blocks became viable. It appears that larger block and smaller block semi-ashlar was applied during the middle part of this period.

Early 3rd century CE until the decline in patronage at Taxila sometime late in the 5th century CE, was a period of great prosperity sacred areas were modified, refurbished, and literally engulfed in new structures that reflect religious concerns quite different from those of earlier centuries. Although stupas and relic shrines were still being constructed, patrons turned their considerable resources to commissioning devotional icons, and the shrines to house them. A middle and late period can be clearly demarcated in the following period: in Taxila there was a shift toward more sophisticated forms of semi-ashlar masonry. The great quantity of architectural evidence dating to this period provides a means to trace how people moved through these sacred areas, and it bears witness to their devotional interests. Without question the shift to iconic imagery is a reflection of changing ideology. However, because the sequence of the sculpture is not easily determined, only the architectural evidence tells us about popular and monastic practices. This structural evidence indicates how these religious changes might have occurred through time.

The beginning of this period marks the introduction of the practice of placing small image shrines suitable for housing iconic images around the main stupa in the sacred areas. The small stupas, formerly covered with narrative panels, also came to be embellished with rows of Buddhas and bodhisattvas. It is likely that during the middle and late parts of period III, complex devotional images probably depicting Buddhist miracles or heavens acquired importance. Although schist remained an important medium for creating images, sculptors began in this period to use stucco, clay, and terracotta; many of these images have survived in situ. This period began with the coinage of the Kushan King Vasudeva II and included the later Kushan, Kushano-Sasanian, and many of the Sasanian rulers.

From 5th century CE to 8th century CE, a poorly understood period of Gandharan history, when Buddhism still survived in Taxila and Gandhara, but patronage declined. No characteristic Taxila type of masonry defines this period, and although several cruciform stupas and at least two Buddhist complexes in Swat were created, this was generally a time when large parts of the sacred areas were abandoned. Evidence for the nature of Buddhist practice is thus sparse, although we can assume that Buddhism was still being practiced, as indicated by the addition of late coins to pre-existing relic deposits of main stupas. The coins of the Alchon Huns indicate the start of this period, and other Hun rulers, the later Sassanian kings Khusrau II and Adashir, and others can be placed in this period with certainty. Determining even approximate dates for the end of this period is also problematic; late coins of the Hindu Shahis, the Umayyad Empire, and later rulers of Kashmir have been found in Gandhara relic deposits.

The patronage declined at this time, and some sites, especially in the Peshawar basin, fell into ruin. In the Taxila region, it seems that a few sites, notably Bhamala, were built using a late form of double semi-ashlar masonry. In the basis of stratigraphy, it appears that dull rubble masonry techniques were also used during this period, as can be observed in the Dharmarajika complex. Cruciform stupa was built at the sites of Bhamala in Taxila, at Shah-ji-ki-Dheri.

#### Architectural Traditions at Religious places

Taxila was the center of a flourishing Buddhist tradition between the 2nd century BCE and the 6th century CE. The people of this area became wealthy through international trade, as objects were exchanged between India, China, and the Mediterranean. Traffic in luxury goods brought streams of foreign traders into this already culturally diverse region, and it is this mix of different people and ideas that makes the study of Taxila both complex and fascinating. In this prosperous setting, many large Buddhist complexes were built at the beginning of the Common Era. Works of art, also produced in great quantity, reflect south Asian tastes and religious ideology filled with western characteristics. The people who lived in Gandhara embraced this multicultural fusion.

The development of Gandhara art and architecture, an extensive range of structures and figurative sculpture, also offers an exemplary model for the study of the larger Buddhist architectural tradition. It was in Gandhara that some of the earliest anthropomorphic images of the Buddha were created as a complement to worship practices centered on relics. Alexander the Great conquered large parts of Pakistan around 330 BCE. After Alexander's death, his generals divided the empire, initiating a complex period of political history known primarily through scattered numismatic evidence recording rulers with Greek names. In the middle of the 3rd century BCE King Asoka, a powerful Mauryan promoter of Buddhism, directed that several edicts stressing ahimsa and dharma (nonviolence and duty) be carved on boulders in his empire.

Taxila was repeatedly invaded by different ethnic groups, which sought to control key passes through the Himalayas. In rapid succession the Parthians, Scythians, Indo-Scythians, Indo-Parthians, and others fought over this region before the powerful Kushans began to move toward Afghanistan from the western Chinese borderlands. Bearing the dynastic title of Kushan, the Kushans gradually invaded Gandhara in the 1st century BCE. Their rule culminated under the kings Kaniska and Huviska in the 2nd century CE, by which time the Kushans had established a large kingdom, extending beyond the Hindu Kush to northern India. They established political stability and unified the many cultures and religions within a single political system. The first Buddhist sites were established in Gandhara and Taxila. The two earliest centers, Butkara I in Swat and the Dharmarajika

complex in Taxila, share many characteristics with contemporary Buddhist sites in sub-continent. At this time, relics of the Buddha housed in massive hemispherical stupas were the focus of worship.

A significant number of Buddhist centers founded in Gandhara. Beginning of 1st and 2nd century CE, sculpture was used to embellish the relic structures. Narrative reliefs recounting the Buddha's life were attached to stupas, and they are invaluable to any study of early Gandharan Buddhism. In this early phase, great emphasis was placed on the historic personage of the Buddha (Sakyamuni); reliefs depicted his miraculous birth, childhood, rejection of life in the palace, path to enlightenment, and role as the teacher of the Buddhist dharma. These depictions also stress his death, focusing on his cremation and how the relics came to be distributed. This emphasis on the Buddha's relics is also seen in the architectural remains where stupas and relic shrines were predominant.

Old sites were expanded and many new centers were founded in the 3rd century CE. Relic monuments such as stupas and shrines were increased with large Buddha and Bodhisattva images, placed in chapels enclosing the sacred areas. By the 4th and 5th centuries, these iconic images were produced on a monumental scale. The appearance of iconic images marked a change in Buddhist practices, in contrast to the narrative traditions that characterized the earlier art of Gandhara. Some scholars have seen this as an indication of the doctrinal shift from Hinayana to Mahayana Buddhism, although recently this has been questioned. The most active period of Buddhist patronage was between the 3rd and 5th centuries CE; the majority of surviving architectural material dates to this period. The increase in patronage probably was not dynastic; the great Kushan Empire was losing power at this time. Only a vague idea of the political landscape of this period can be formed from coins of the Kushans, Kushano-Sasanians, Sasanians, and Kidarites.

In 5th and 7th centuries CE, Chinese Buddhist pilgrims began to visit Gandhara to see famous relics like the Buddha's alms bowl or his skull bone. Short biographies of many of these Chinese monks survive. The extensive travel accounts of Faxian (401 CE) and Xuanzang (630 CE) reveal much about the late Buddhist tradition of Gandhara and Taxila. A little evidence of Buddhist activity at some isolated sites in the Peshawar region survives, and a few of these centers seem to have remained active until perhaps the 8th century CE.

The urban and Buddhist remains at Taxila lie beyond the Indus river and became a major center because of its position at the juncture of two major trade routes: one through the Hunza valley leading over the Karakoram Pass into China and the other running east-west from Afghanistan through the Peshawar plain to India. The earliest urban center in Taxila is known as Bhira mound active between the 5th and 2nd centuries BCE, in a time that pre-dates the introduction of Buddhism into the northwest. The later City of Sirkap includes very early urban sacred areas, some of which are Buddhist. Near the walled metropolis of Sirkap is the Dharmarajika complex, founded in the 1st or 2nd century BCE. This was the most important Buddhist center in Taxila region and the focal hub of more than a dozen smaller sites, including Kalawan, Jaulian, Mohra Moradu, Bhamala, Jandial B and C, Akhauri A, B, and C, Khader Mohra DI and D2, Kunala, Pippala, Lalchak, Ballar, and many other unexcavated sites. Near Taxila is also the large Manikyala stupa, which has not been fully excavated. The concentrated architectural evidence from Taxila that can be dated between circa 2nd century BCE and 7th century CE is fundamentally important for understanding the larger Buddhist tradition of Taxila and Gandhara.

## **Architectural Features of Buddhist Centers**

In Taxila, Buddhist religious centers were usually built outside of urban centers. They were composed of a sacred area for public worship and a more private monastic section with monasteries (Viharas) and small devotional structures. The public sacred area and private monastic space were built to serve the religious needs of at least three distinct communities: lay followers, resident monks, and local and long-distance pilgrims. A typical sacred area is composed of a main stupa surrounded by small stupas and shrines either for relics or for images, as at the site of Jaulian in Taxila.

A relic of the Buddha was the central object of worship, giving power to the site. The sacred area served the needs of the monks and the common people, and its structures were thus for public use. In contrast, shrines found in the monasteries would not have been so readily available to the common people, and they have a very different character.

### **Buddhist Stupas and Monasteries at Taxila**

The site of Jaulian provides an excellent point of departure for understanding the range of devotional structures of Buddhist sites in Taxila. The first structures built at Jaulian were the main stupa, a single adjacent smaller stupa, and the monastery, all of which were constructed in diaper masonry. The main stupa was believed to contain powerful relics of the Buddha and was always the primary devotional focus of all groups of devotees who used the complex.

In Gandhara, main stupas have a high square or rectangular base, which supported a dome or anda that could be accessed through a flight of steps placed at the center of the stupa's main facade. The square base marked the sacred space of the stupa and gave the monument additional height, making the dome more visible. The domed anda would have been surmounted by a square harmika from which rose a pole (yasti) and a set or stacked umbrellas (chattravali) to mark the axis of the stupa and the sacred relics of the Buddha in the monument's solid core. People would walk clockwise around the base of the main stupa to be in close contact with the relic, a practice known as pradakhsina. This ritualized movement around the stupa appears to have dictated the placement of additional devotional structures, as patrons would want their donation to be easily seen and used by all who visited. Because the power of the relic was conceptualized as radiating outward, added religious structures were grouped tightly around the main stupa to be in the presence of the Buddha. Thus, a main stupa was at the core of every site's public sacred area, and inevitably this stupa was one of the first structures erected.

**Votive Stupas:** Smaller stupas in the sacred areas are typically grouped close to the main stupa, as in the case of Jaulian. Although most of the diverse additional stupas were added over time, usually one of them was constructed at the same time as the main stupa. At Jaulian the main stupa was constructed at about the same time as a small stupa to the east. Twenty eight small stupas were built in the sacred area. Some of the subsidiary stupas, generally donated by devotees, contained important relics considered worthy of independent veneration. An example is the small stupa D6, placed in its own enclosure on the east edge of the sacred area. The function of these small stupas remains a mystery. Scholars have suggested that they may represent votive offerings or perhaps may have housed the remains of monastic dead. The site of Jaulian, like others in the region, had for about 300 years a multi-storied monastery (it contained at least 56 residential cells), yet only 28 small stupas were constructed throughout the life of the site. If the stupas contained the ashes of the most important monks,

they would have been special structures and not ordinary burial units; many more monks would have died at this site in 300 years.

In the early Buddhist tradition, relics were the focus of worship. They were generally deposited in main stupas; however, shrines where sacred physical remains could be placed and worshipped became very important in Gandhara. These shrines consist of either chambers containing small masonry stupas or structures suitable to openly display relics such as the Buddha's alms bowl or a piece of his skull, both of which we know could have been seen and touched in Gandhara.

The relic shrines housing stupas can be found at the site of Kalawan in Taxila, where at least six can be identified. On the basis of evidence from a range of Gandharan sites, it seems certain that this category of shrines was used to openly display relics to be seen and touched by worshippers. This would have been the kind of structure that contained the Buddha's alms bowl or his skull relic, which are described by the Chinese pilgrims who visited Gandhara. At a few sites main stupas were constructed in such a way that their room-sized relic chambers could be entered. It appears that such direct-access main stupas were built to house relics that were suitable for open veneration. A characteristic example of such an open able stupa is the main stupa at Kalawan, which had a large, finished relic chamber.

Stupas embellished with Sculptures: Religious art, particularly sculpture, was everywhere in the sacred areas of Gandhara. While some of this material was purely decorative, much of it was central to the religious goals of the community. In the earliest periods, circa 2nd century BCE to 3rd century CE, the sculpture consisted of narrative reliefs illustrating the Buddha's life, affixed to stupas so that they could be read during circumambulation. A good idea of how Gandharan small stupas would have been embellished can be gleaned from a nearly complete assemblage of sculpture found in a two-celled stupa shrine from Marjanai in Swat. A full set of nine life scenes of the Buddha and a larger panel in the shape of a false gable were recovered within the shrine immediately adjacent to the stupa. The panels, worked in schist, depict scenes of the Buddha's birth, childhood, enlightenment, and death; special emphasis is given to the creation and distribution of the relics, one of which presumably resided in the stupa to which these reliefs were attached.

In the early part of 3rd century CE, shrines designed to contain life-size Buddha images began to appear, as is evident at Jaulian. The first image shrines added to this site were small and functioned to define and enclose the main stupa court. In contrast, the late 3rd century CE image shrines on the southern edge of the site were huge and must have contained monumental sculpture. A consistent chronological trend can be observed in Gandhara: small image shrines gradually give way to larger shrines and ultimately to massive chapels. At Jaulian nine image shrines were added to the passageway leading to the sacred enclosure of the subsidiary stupa, indicating that this particular stupa was important enough to warrant ongoing patronage. Small images in stone or clay or stucco were also donated by individual patrons who could not afford to place a stupa or an image shrine in the sacred area. These small images were placed where space permitted, but they were concentrated at devotionally significant places, especially near important relics housed in stupa shrines or close to the main stupa. This practice is well illustrated at Mohra Moradu in Taxila, where the primary facade of the main stupa was crowded with various images likely given by a host of minor donors.

Monasteries: Gandharan Buddhist monasteries, particularly those at Taxila, are superb examples of planning and execution of monastic architecture. These combine to best form the triangular relationship of man, nature and the creator. Jaulian Monastery and Mohra Muradu Monastery are the best examples. A typical Gandhara

monastery is usually a square or oblong plot, repeated once, twice or more with monastic cells, lecture halls, dining rooms, refectories etc. The stupa court usually consists of Main stupa on a square base and votive stupas and chapels arranged on all four sides of it. The cruciform shaped stupa of Bhamala is a rare example.

All the religious complexes in Gandhara have one or more monasteries, or viharas; two main varieties are found in this region. Well known are the large, multi-storied quadrangular structures, like the one at Jaulian in Taxila, which have monastic cells organized around an open courtyard and attached rooms for cooking, storage, etc. When the steep, mountainous terrain disallowed the construction of quadrangular monasteries, clusters of mountain viharas were built. They consist of groups of small, multi-storied structures set on the hills adjacent to the sacred area.

Large multi-storied quadrangular monasteries were generally preferred not only because monks could live together, but also probably because these large buildings surrounding a courtyard offered more security from passing bandits. The foundations of tower-like structures can be seen at several sites. A good example is the square solid foundation attached to the exterior of the northern wall of the Dharmarajika monastery in Taxila.

At Jaulian in Taxila and at other sites, the quadrangular monastery was built at the same time as the main stupa; building a residence for monks was a fundamental requirement for establishing a new religious center. Inscriptional evidence confirms that kings built stupas to establish relics in new locations; to complete the offering, they donated monasteries and made financial provisions to support the monks. For the donor, merit was generated only when the offering was used; thus, establishing a residence for the community of monks ensured the ongoing use of the donated stupa.

The Jaulian quadrangular monastery is a fairly typical medium-size example, having 26 residential cells arranged around a central courtyard. This masonry structure, which has survived in the archaeological record, served as the first floor of a multi-story building, as an extant stone staircase testifies. The Chinese pilgrim Hsüan tsang in the 7th century described a monastery in India probably in Taxila; while this cannot be said to apply directly to Gandhara, it does shed light on what these structures might have looked like:

The sangharamas are constructed with extraordinary skill. A three-storied tower is erected at each of the four angles. The beams and the projecting heads are carved with great skill in different shapes. The doors, windows, and the low walls are painted profusely; the monks' cells are ornamental on the inside and plain on the outside. (Hsüan tsang)

The center of the rectangular court, accessed from each side by a flight of steps, was sunk about 60 cm in order to catch the rain- water from the veranda, and it was equipped with a drain. A small room, accessed by a short flight of steps, is usually found in the open courtyard, but its function is not clear. The monasteries were modified over time in response to the needs of the community. At Jaulian, for instance, large chambers were added to the west of the residential area and were accessed by a doorway cut into the back wall of cell 15. Probably most of these rooms were used to store and cook food, as the drains found in rooms J, K, and L suggest. The large chamber G has four central pillars supporting the ceiling, so it may have been used as an assembly hall instead. Although no positive evidence exists for this supposition, the presence of similar large halls attached to quadrangular monasteries at many Gandharan sites indicates that they fulfilled some important function.

The monastic cells all have a niche that might have been used for storage or as a place to set a lamp. However, evidence suggests that sometimes images were placed in these recesses, making private shrines. In cell 2 at Jaulian, a schist panel with a depiction of the Buddha flanked by two worshippers was found in situ in one of these niches. The presence of this image together with a small bronze Bodhisattva image from the Jaulian monastery, a copper Bodhisattva figure from the Akhauri monastery and a copper Buddha from Shah-ji-ki-Dheri, indicates that monks were using personal image shrines.

## **Conclusion**

The history of ancient Taxila is based on the study of art and architecture unearthed in the region of Gandhara. But, despite several efforts already made by the Indologists, certain areas of the political and cultural profile of Gandhara still remain obscure and disputed e.g. the chronology of the Kushan kings particularly that of the later rulers of mentioned dynasty. After a detailed examination of the Gandhara sculpture of the Kushan regime, many flaws and vacuums that were existed before can be partially resolved and fulfilled. The most significant feature of Taxila is the construction of royal temples. The various epigraphic references and different archaeological excavations attest that the Kushan kings particularly the early Kings erected temple or sanctuary or shrine for the images of Kushan gods who granted them kingship and images of the Kushan kings. From different sources it is know that various religious structures in different regions were built by the Kushan kings like the Mat (Mathura) Temple of Vima-I Takto, Oesho sanctuary of Vima Takto, Surkh Kotal temple of Kanishka-I and Kanishka-I sanctuary of Rabatak inscription. The religious structures that get portraiture in the Gandhara reliefs include stupas with all their components, domed-shrines and Fire-temples. Thus, one notices the fusion of foreign and native traits obvious in the portraiture of architecture in the Gandhara Sculptures. The sculptors of the Gandhara narrative reliefs perfectly portrayed the architectural details which include everything from a modest but to a magnificent palace. The architecture revealed here betrays indigenous traits and distinctive foreign impact. Obviously, therefore, the buildings reveal the happy blending of the two techniques of the native and Hellenistic artists. The palace interiors, city walls and city-gates illustrated in the reliefs, were of the highest form of civil architecture all of urban type. The palace interiors had private chambers, bedrooms, baths, dressing rooms, royal horse-stables, etc. These buildings were, invariably, supported by Indo-Corinthian Pilasters or Persepolitan columns. The city-roads were broad and could accomodate huge processions.

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# Prototype of grid in Archeological planning History

**Dr. Javeria Shaikh**

*Abstract:*

*The vast use of urban grid has long history of evolution, the precision of urban grid used today is not a coincidental occurrence but it is an overlap of several transformations over centuries. There are several factors which shaped today's modern grid. Grid has historical and spatial dimensions, varying from micro level anthropomorphic need of forward, backward and left, right human instinctive navigational system. To a macro level of urbane need of human nature to move from rural unplanned life style to a more metropolitan planned city which is expendable this is achieved by employing universal grid form. The main motivation behind this paper is to retrogressively trace the origin of the prototypical grid form. It is therefore inferred that the grid originated prior to Oglethorpe's Utopian intelligent Savannah's plan of American city plan, in form of Hippodamus of Miletus, 498- 408 BC earlier to Indus Valley 2600–1900 BC, mature operational grid, which has prior precedence of Çatalhöyük 7500 BC to 5700 BC.*

**Key words:** Archaeological Planning, Urban, Grid, evolution, Metropolitan, Indus Valley

## **Introduction:**

The line of reasoning followed here is that there is a homogeneous occurrence of the grid pattern ubiquitously throughout the history of cities. Prior to the four-folded variables is applied to analyze the cross-sectional regression model which explains grid system which associates present grid with three different eras of Mohenjo Daro (Indus Valley Civilization), Mehargarh (Baluchistan) and Seven Set of Caves (Sehwan 10,000 BC). The limitation of the investigation is the innate difficulty of the agreement and the pursuit for the derivation of the grids.

Conclusively five -P factors which were characterization to be the key motivation behind grid are People, Place, Power, Politics and Product-ability, thus a grid urban pattern comes into being when: firstly the power of people are united to build an Urban Modern city, secondly there is a place available, thirdly technology and willingness to have a expendable navigational plan, allowing ease to move permitting security along with infrastructure of drainage and transportation. These five P: criteria fit not only to as late as Greek planning but as it is pushed back to Indus Civilization to Mehargarh even way back to Cave Dwelling where the modern grid could be found.

The Utopian intelligent grid used at Georgia and Savannah (1734) is considered masterpiece example for American Urban planning and city squares De Vorse (2012). Miletus ( 479 B.C.) designed by Hippodamus on grid iron system followed by the neighboring port of Athens, the Piraeus (450 B.C.); the Panhellenic colony of Thurii (built in 444–3 B.C.); and the city of Rhodes (built in 408–7 B.C.). However, Piraeus is a precedence for Hippodamus's Urban Planning. Grid origin is prior to Hippodamus's, even earlier than Indus river valley, Mesopotamia, Assyria, and Egypt and it could be further tracked back to of Çatalhöyük and Mehargarh planning. The aim is to trace the prototype and origin of the grid which is hypothetically argued in the paper to occur as early as cave dwellings flanking the Indus Civilization. The current Western urban planning along with the orthogonal Greek cities were standardized and designed before Hippodamus. The grid made more than a few unintentional comebacks, but the inherent historical complicated traditions narrated with grid, reinforced modernist to materialize and re-own history. Hence the grid of New Urbanism is not similar to Le Corbusier grid, nor is Spanish, Roman and Greek grid similar; neither Chinese, Korean nor Japanese grid tallied, nor the Mohenjo Daro, Harappan grid had commonalities, or none of Egyptian or Mesopotamian grid matched (Brass,

2004). Having said that: the historians discourage use of grid due to its inherent rigidity due to its heavy influence of Governmentality and the geo-coded and could be referred to as gridded lives Brown, (2001).

The early man was flourishing in Urban Planning and other techniques of tool and agriculture. In Sind, civilization must have contemporaneously arisen which lies in the deeper layers of Mohenjo Daro and other sites, but cannot be explored due to water-logging. In China, parallel Civilization arose along the Hwang Ho River. The urban planning in traditional neighborhoods of China are structured on highly hierarchical zoning varying from big avenue scape (da jie), to the street scale (xiao jie), then the local street (xiang) and finally small alley (Hutong) (Gao, 2003, Sheng, 2005). Study of the consecutive axial grid plan of a town and other pertinent chronological suggestion from the origin of date, has capacity to reveal the expansion of the axial grid settlement of town planning in terms of apparent external expansion and internal transformation over generation, insofar as the plans given adequately the three element compounds of street arrangement, plot configuration, and building coverage, as rationalized by Levinson & Yerra (2005) as How Land Use Shapes the Evolution of Road Networks.

Archeological remain suggests that the hunters and the gathers selected spots along the banks of mountain in the plains, where they selected cultivation of crops of selected cereals and domestication of sheep and goats. Hence the first urban planning, of compact city model emerged, which is discussed in this paper. In the period 30,000 to 10,000 BC, the nomads from the regions to the west of the Baluchistan Plateau may have started to move towards the Indus Plain. A certain amount of mix races may have been taking place as the hunters and gatherers roamed across different region of the Indus plain in search of more diversified sources of food. These citizens had improved tools and technology; there was a willingness to live nearer. They were able to use soft hammers to produce sharp edges blades and scraps used by the hunters and gatherers to earn their livelihood. Around 10,000 BC, major development towards settled form of life took place in the region. From dependence in wild plants and animals, a move was made towards organized farming in the river valleys in the hilly regions of Northwestern Balouchistan and in the plains.

There is a stark vacuum in the examination for the functioning of grid in accordance with the topographical restraints; from the time when the grid was used at Devils Mouth the first (Rakas jo Rohro) and Sath Ghari, Seven Small Caves. Cave dwelling is an entirely reverse mould typology, it offers ample closure critical of the threat from wild animal. It also facilitates variety of spacious spaces for varying classes or congregational meetings. Whilst typology and topology of the street perception is atypical from Mohenjo Daro and the cave, however the morphology is the similar. That is the relationship of positive and negative for morphology is distinctive. For example the brick made buildings at Mohenjo Daro and mud construction in case of Mehargarh; are constructive addition on plane topography. Whereas the cave typology is a subtractive mould removed out of the hill topography to construct grid layout of cave dwelling; as an example of a distinctive morphology. Additive and subtractive approaches are used by early human to displace nature, and re-shape geography to construct settlements. In case of Seven Caves settlement hill was carved and nature was displaced. Whereas Lusbella caves was combination of subtractive and additive morphological composition where the cliff spaces were carved out according to grid plan and outside the hill exterior walls were shaped out of adobe; in 7000 B.C. When human was confident to migrate to the plane with his morphological skills and construct his settlement on planer zone. A highly urbane Mehargarh first highly sophisticated city planned grid pattern mud construction took place on plane region. At Mohenjo Daro bricks were constructed out of clay hence as (Duany 2000) points out 'nature was displaced' and brick became pivotal motivation for an orthogonal grid.

Here authors aim to add to the argument by presenting theoretical perspectives on what Welbank have described as The Search for a Sustainable Urban Form. The study revolves around the core question of urban history of grid, the evolution of the grid planning of pre pottery period and its evolution to modern times, since this has been a key issue in the urban morphology and criticism. The definition of modern city has also been applied to the pre- pottery cave ranges in Ancient Sindh. This definition is not merely limited to Childe's classification of writing, politics and trade, but the main aim here is to consider the hierarchical urban definitions, hence the modern urban concepts of Jane Jacobs, Edward Glaeser and Wheatley comparison of the institutional change and the major socio-political restructuring of society, for the development of the civilizations; are applied to the primitive urban planning to measure the applicability in conclusion.

The urge or human instinct to migrate from rural to urban land and the major drive of choosing the site is: not severe weather Nelson (2009) described this phenomena by simple defibation of Grid and Anti-Grid, thus grid defined urban and antigrid defined rural an example of landscape 'dialectic of socioenvironmental ideals'. For example igloo habitat is curvilinear and organic as well as semi-nomadic clusters are also relatively un-planning and organic in nature of expending. Thus when primitive people decided to move to a new town they planning it on a place which is moderate climatically and they chose grid to show their power and production abilities. All the factors when tested on the primitive site of Cave dwelling qualified it to be referred as an Urbane and planned town. This investigation is further expanded by providing evidence for the grid patterns remain from pre-historic times.

The literature review signifies that there is a vacuum in the temporal models as resented by (Stanslawski 1994) which tracked the grid plan up to Mohenjo Daro (2500 B.C.). The analysis of (Gangal. K et al 2010) on Mehargarh (7000 B.C.) for tracing the Indus urbanization does not consider the prototypes which existed earlier then Mehargarh, therefore our research further expand through providing evidence for the grid patterns from pre-historic times.

## **Literature Review**

The literature review of orthogonal lattice characterizes by synthesis of four distinctive variables of urban grid arrangement, Williamson (1986) and Bokil (2009). These are primarily alignment and distribution of spaces on basis of public and private performances and mixed used concentration overlap in form of semi lattice (jointed) rather than a tree diagram (disjointed) C. Alexander (1966). Secondly circulation of people, i.e. how axial grid can facilitate, people to reach from one point of city to the other, and this also includes how people visually connect Baran et al. (2008). Geometrical mechanism is the third determinant which makes the axial grid, which include straight lines and right angles which supports growth, change and efficient security through eyes on the streets (Jacob1961). Finally density this incorporates both the fringe belt as well as the burgage cycle process of Cozenian theory of expansion of town planning Lang (2004). Furthermore Human being represents evolution by maintaining a homogeneous approach towards argument building flow in the spatial-temporal longitudinal approach.

Today the natural shape of cities at least for many Americans is an obvious a grid-patterned cities and it is very common in the United States De Vorsey, (2012). The grid pattern came to play a dominant role in the design when Alexander applied to the new city planning throughout the entire empire before grid iron pattern was used in Greek cities from 480 B.C. until 336 B.C van der Vliet (2008). Moreover Indus Valley civilization had three major cities Harappa and Mohenjo Daro here was a separate commercial boulevard and small residential

alleyways similar to the present day New York, Johnson-Roehr (2014). The validity of straight line which is the fundamental algorithm of the formation of the grid, shown in figure 5 where the orthogonal grid pattern is represented, hence Kostof (2009) asked who invented the grid or right angle which is core of grid popularity.

The ongoing search for the archetypal for grid plan; Rose-Redwood (2008) adjusted the exploration for the descent for grid by Stanislawski's (1946). Apparently Stanislawski presumed that further archeological findings would latter formally direct his study of grid to an earlier history. This archeological evidence has been unearthed by the French archeologist team led by Jean-François Jarrige; when Mehargarh was discovered after prediction of evidence for grid planning by Stanislawski in 1946. The excavations showed the grid morphologies existed earlier as well, since excavated continuously between 1974 and 1986. Caniggia's theory: human history is the same as natural history each involved the processes of birth, growth, prime of life and death.

Bafna and Steadman explained the rectangularity and orthogonal approach of the built form based on American architect Albert Farwell Bemis 1930 survey where solid blocks were majorly rectangular up to 83% from a sample of 217 apartment and houses in Boston. The other precedential study was conducted by M. J. T. Krüger in the 1970s, to study the urban morphology and the percentage of rectangular built forms in Reading city (Berkshire) was traced to have rectangular geometrical morphology on the survey map that he concluded up to 98% of the geometry was based on grid. Secondly, according to Fox (2000) since the human mind navigates distance on two dimension plans, using route or linear strategy, a person would obtain directions from point A to point B (Robin, et al 2009, Jiang & Claramunt 2002). If they needed to go farther, they would obtain directions from point B to point C, therefore naturally grid shape is created. Grid relation of absence and present as public and private, adds to the third dimension of North- South- East- West, therefore relating to the movement of sun, wind and water; as Vitruvius (1st century BC) describes in *De Architectura* and then to movement of people and eyes (Jacob) by orientating cities with natural directions, makes the urban grid legible and increases inhabitant's sense of the structure and time Lynch (1984) a street with ventilation behaves as breather for the city. On the other hand the archeologist and historians, appeal to the urban planners to analytically design the grid iron, due to its repercussion in history, grid iron once rooted in urban accumulation, it's problematical to revise for further modification (Possehl 2001). Similarly Grant suggested that based on Jacobs hypothesis, the contemporary planners starting, fancying the old town grid and appreciated its mixed use over the winding organic suburban streets. He defined grid as an anathema (antonym) to closure and hierarchy, and as an antagonist (synonym) to locus and place.

Dan Stanislawski discussed the disadvantage of the axial grid plan that is restriction of placing the temple, house, library or workshop, according to the desired position and orientation, with regard to the sun, air or privacy. Moreover he criticized that the grid does not respect the integrity of topographical mountains, falling steep valley or hills. This paper provides the case study of a primitive city plan, designed on the grid system which respects the topography. (Teresa Stoppani 2008) questions the validity of the axial grid, definition of the grid is in contrast with the question of (Stanislawski 1946). She questions the validity whether a grid still remain a grid if it could accept external variables and incorporates change. Stanislawski (1994) discussed the disadvantage of the grid plan primarily restriction of placing the temple, house, library or workshop, according to the desired position. Secondly, grid does not allow preferred orientation, with regard to the sun, air or privacy. Thirdly he criticized the grid does not respect the integrity of topographical mountains, falling steep valley or hills. Here case study portion provides primitive city plan, designed on the grid system which respects the topography.

Whereas Grant (2001) presented an argument that Mohenjo Daro, Harappa, New York and contemporary Utopian cities used grid as a Diffused authority on the other hand, Egypt, Babylon, Alexandria and China used grid as a centralized authority, whereas Greek, Roman and Japanese used grid for globalizing authorities. In a diffused plan, the placement of squared, religious area, recreational facilities, and common public use building placement is placed without emphasizing hierarchy. It was an elaborate middle class society, with amenities including baths, wells, granaries and workshops. Mohenjo Daro shows axial grids of narrow paths, as a protection from flooding they enjoyed higher standards for living. Similarly in Miletus masses enjoyed public space and facilities of houses. Food and drama are two areas where cities have an edge Edward Glaeser, 2011 'Triumph of the city'. Hence this was a earliest city, The hunting tools include hand axe and cleaver core tools of discoid and elliptical outline, and also chopping tools and flakes. Such tools have been and may really be the middle Stone Age tools rather than the early Stone Age tools. And Shakespeare's line, "what the city but the people" is true for this Stone Age settlement, Cities grow by building up, or out, and when the city doesn't put together, people are taboo from understanding the magnetism of urban nearness.

Rose-Redwood (2008) believed that the grid made several accidental reappear. He further points out that historian predict that the grid arrangement was exported overseas from Mohenjo Daro to Greece, through anonymous travelers. On the contrary arbitrarily quest suggested by Stanislawski for diffused origin for the grid. Moreover grid is an instrument to commoditization of space, grid facilitates liberal legal regime by creating boundaries to form a capitalized market for selling parcels of land (Rose-Redwood, 2008). Here in this study (Childe 1950) urban revolution theory is been applied on the town planning of Mohenjo Daro and Mehargarh urban settlement. Since four chronological eras have shaped the human life; Hunter gathering, agricultural revolution, pre-industrial revolution and industrial revolution. The first was the revolution that led to the development of the agriculture around 7,000 years B.C.

While according to Michael Smith (2007) ancient cities follow a common sense notion for urban grid morphology, and Spiro Kostof (1993) described orthogonal planning of earliest city Middle East Jericho (8000-6000 B.C) as a grid lay out, which is contemporary to Mehargarh, Jarrige, (2008) and (1993).

## Methodology

To justify the urban revolution transition and grid planning development, from Late Stone Age to Mohenjo Daro, Sindh; the methodological approach for this study employs firstly, we will examine the theoretical back-grounds and linear fashion. Thus grid theory is applicable for all three eras, where at Mohenjo Daro grid used according to Indus River as a fixation line for a mature- agricultural city. For Mehargarh Bolan River was the urban fixation for semi- agricultural and semi- hunter and gatherer city. Whereas for Seven Caves the first a hunter and gatherer settlement, wind eroded central spine through the horizontal core of the hill which acts as a fixation line.

Theoretically, the argument present by Gangal. K et al (2010) fills the vacuum between the retrogressive spacio-temporal models by presenting the model for agricultural society at Mehargarh preceded by nomadic hunter-gatherers settlements in caves. Morphologically this paper bridged the gap of the grid form which is been investigated by Stanslawski (1994) who traced the grid plan up to Mohenjo Daro (2500 B.C.). While our research expands further the original prototype by suggesting urban morphologies earlier then Mohenjo Daro and Harappa. Case studies of evidence based grid planed cave morphologies are presented up till ten thousand

years. We have conducted field surveys to infer urban grid patterns in three cities in the vicinity of Pakistan during the Late Paleolithic era.

At Micro level the phenomena of grid is driven from the ergonomic innate constraint of human anthropology: for direction-finding along with right, left, forward and backward. This centuries old understanding is applicable to map reading and route planning of syntax along axial movement and eye connectivity tools of design and ease to communicate for the understand-ability and simplicity of the place as grid. The timelessness and universality of grid makes it easy to rent, occupy and proper demarcation of the premises. Furthermore, (Fox, 2000) defines grid as how geography shape our brain or how to convert terrain into territory, the geometrically shaped patterns are according to our ability is manmade. Our brain is trained to measure, by imagining straight lines according to our vision, when we visit a new place we want to know our current position, according on a two dimensional map constructed in our mind, we also would like measure in our surrounding with respect to the other side of our vision. Therefore, it is not surprising that humans had been using the grid system from the beginning of human settlement.

At macro level: expandability is the key motivation since; when compared to other town e.g. circular plan of Baghdad (al- Mansur AD 762-7) which does not allow the spread out and equal plot size but rather gives wedge shape spaces wrapped around the central bazaar space with limited opportunity of expanding. Brick was a major motivation as a unit for the orthogonal planning and other constructional constraints also spell out the demand for grid planning.

The sequential history of the compact city plan in the ancient cities of Pakistan is looked into, where the urban grid prototype was associated with a mix of land uses. In addition, grid was the means by which a town became a “mechanism for generation contact” and it did this by ensuring that a typical origin-destination trip will take a pedestrian past several outward-facing buildings as explained by Hillier, 1999. Study of the consecutive axial grid plan of a town and other pertinent chronological suggestion from the origin of date, has capacity to reveal the expansion of the axial grid settlement of town planning in terms of apparent external expansion and internal transformation over generation, insofar as the plans given adequately the three element compounds of street arrangement, plot configuration, and building coverage (Conzen 2004).

### **Analysis Case Study Sites**

Evolution of grid morphology, in the history of Pakistan urban planning is studies in this section. Pakistan is the country where the Indus Civilization took shape about 5000 years ago, here the evidence of the early human use of grid planning as early as 10,000 B.C.

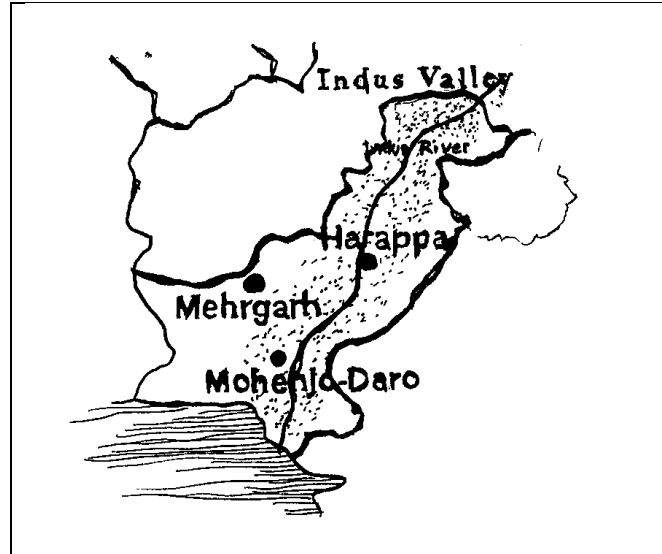


Figure 1. Setting of precedence Study sites

The core arguments here are that there is a regular occurrence of the grid pattern ubiquitously throughout the history of cities. The four folded variables are applied to analyze the cross-sectional regression model which explains grid system which associates present grid with three different eras of Mohenjo Daro, Mehargar and Seven Caves at Kai. A grid for a city defines special and functional nature as a whole, without the grid, city would eradicate all the characteristics of concentration, high-quality spatial scale, controlled juxtaposition of utilization of spaces, continuity, and incorporation of precise -ordering for the city depends on the grid. This characteristic was fulfilled by early human well designed compact cities at different times the figure.1 and table 1, synthesis the aspects he was aiming to achieve.

### Case study one: Mohenjo Daro

The origin of the Mohenjo Daro grid was not following religious orientation as Egypt and Mesopotamia. At different stages of historic evaluation grid represented political-economical regimes as at Mohenjo Daro, it was associated with diverse cultural interpretation, and it is been make the most of historical-geographical miscellaneous selection of interconnect development performed as observed at the seven cave (Sath Ghariyon) plan. Hence to suppose grid as an indistinguishable natural and ideal form is exceptionally inconsequential for the reason that grid has innate complexity it possibly will be either open or closed, previously referred as outward-orientation e.g. Seven Caves: which is centrifugal and later referred as inward-orientation Rakas jo Rohro the first: which is centripetal. Hence grid will never be straightforward rectangular geometry but a thoroughly coordinated network though there is a spatio- temporal void between Seven Caves and Mohenjo Daro.

The datum or the line which unified the grid or is the motivation behind the development of the city planning is referred here as (river Indus id fringe belt for Mohenjo Daro and wind carved cave is the fringe-belt for seven caves) Fringe-belt development: the formation or intensification of a fringe belt of mixed and generally space-consuming land uses on the urban fringe during periods of reduced outward residential growth. The process passes through the fixation phase, the expansion phase, and the consolidation phase. This brings us to the necessity of research in historical geography within urban studies, a meeting-ground of geographers and historians.

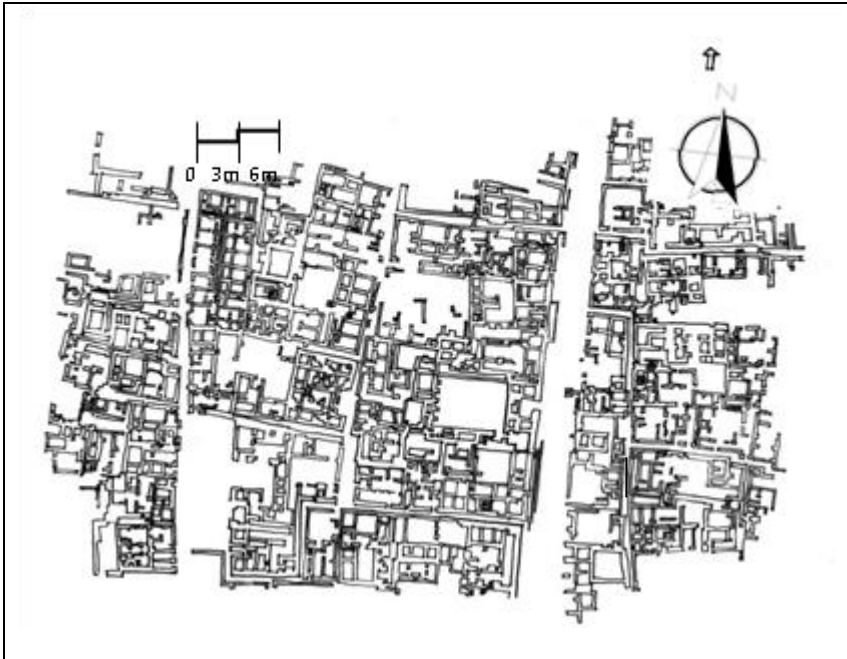


Figure 2. Map of Mohenjo Daro

Mohenjo Daro was perfectly patterned gridiron, as precise as modern day New York City, serving 35,000 inhabitants<sup>1</sup>; this gridiron contained the covered ducts to refrigerate the grains. A plumbing substructure which achieved premium of hygiene with parallel underground sewage system moving towards Indus River independent of the city's drinking water supply (Higgins 2009). Harappan civilization was the largest urbanize Bronze Age community starting form Neolithic culture starts 7000 BCE, The analysis by Ganga et al, (2010) reveals growth in urban patterns of Harrapan civilization was composed of urban complex plan. Spatio-temporal Analysis of the Indus Urbanization. Gangal, et al (2010) further studied the Spacio- temporal study of the Indus Urbanization and gives an account with rough deviation probability about the spread of the Indus Sites, the Neolithic site, spread over the temporal period of 2000 years. The larger site have satellite towns as an urbanism pattern, the temporal model traced back the history of urbanism to Mehargarh, Baluchistan. The figure three above shows that there are simple multi rooms buildings, the spaces between the rooms provide space to burial and for domestication for food-production economy. The village farming community was founded and the start of Harappa Civilization started.

### Case study two: Mehargarh

This area was excavated, layers by layers, radiocarbon dating each layer, as shown under in figure one, Thus the MR-3T area sounding represents an accumulation of six and one half meter of entire Aceramic deposits, including eleven architectural phases. The studies of L. Costantini and R.H. Meadow have brought to light a process of transformation of the subsistence economy.

<sup>1</sup> The Earth and Its Peoples, Brief Edition, Volume 1, By Richard Bulliet, Pamela Crossley, Daniel Headrick, Steven Hirsch, Lyman Johnson, Chapter 5: The Rise and Spread of Civilization in India c. 2500 BC- 1025 BC page 114

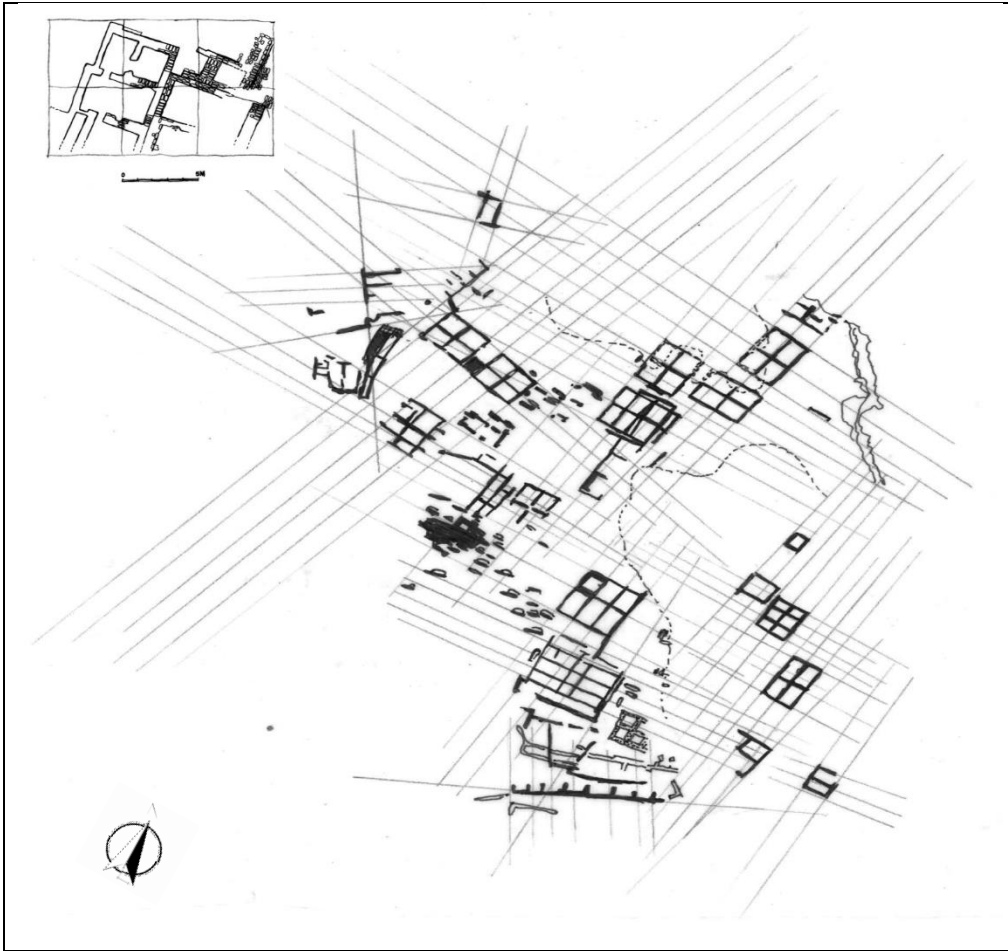


Figure 3. re-traced from: Mehrgarh field report 1994-1985 In the northern part of MR3,

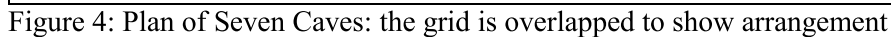
two buildings were exposed one only partially (three rectangular rooms), the other measuring 8X5m, figure four, This latter structure has ten rooms, the seven longer ones (each about 3X 1.5M) The walls, very thin are composed of a single row of bricks.

It is probable that some of the relatively unusual characteristics of Mehrgarh when compared with the first villages in the area of West and Central Asia, in particular its size, can be explained by links to an Upper Paleolithic pattern of social organization perhaps characterized by relatively large seasonal concentrations of population with the context. (This is the aim of this paper,). It is thus clear that the natural resources of the region had been exploited well before the beginning of the occupation of Mehrgarh .

The urban morphology for early man depended upon his way of vocation earlier than agriculture (8000 BC) native were making tools to sell, this is the pivotal point in history where he has tool to construct therefore he planned dwelling towns (Possehl 2003). These towns were based on well calculated orientation and the understanding of Homo for geometrical and ergonomically proportional features (figure 4 and 5) represents the intellect and precision of urban morphological decision. Moreover the 1:2 rectangular proportions for the room and the 45 degree angle overlapped shift which is parallel to north qualifies Homo as an urban designer for this earliest cities.

### Case study three: Sath Ghariyoon (Seven Caves)

Early human showed major progress, he was evolving and becoming more humane, he was discovering more material and career and more formalizing planning techniques, (Snooks, 2002) figure two represents all the



The history of urban morphological forms approach can be found in question which is raised by (Duany 2001): 'Is there an existence of manmade places that are as valuable as the nature they displaced?'. Thus the deliberate substance deducted from the Rohri hills to carve out precise amount of space that is sufficient and comfortable for the small city. Sind was capable of supporting higher density of population than any other part of the Sub-Continent under conditions existing then. It was probably during this time that crude raft boats and fishing hooks were evolved. Skin floats and nets for fishing, would probably have come a little later.

For some time, instead of constant wanderings from place to place, these semi nomads restored to seasonal migration. They spent their winters in the plains down below and returned to the settlements in the hills during summer. This semi- nomadic life taught them the basics about cultivation of crops, rearing livestock, making vessels out of clay and building houses out of mud and reeds. In the early period, when the practice of agriculture was still in the elementary stage, these semi-nomads continue with their hunting and gathering to supplement the local food resources. In due course some of these nomads gave up their seasonal migrations altogether and established the first permanent settlement in the Kachchi Plains, hence the formation of the orthogonal town plan came to being. The great enlargement of an organized population meant a much wider level of social integration. This aspect was very pivotal when applied to the planning of the 10,000 year old cave city, since it was growing in a landscape plan form. Therefore the size of the first layer of the city at Seven Caves must have been more widespread and more densely populated than any preceding settlements.’ These caves show human inherent nature of vicinity and coexistence.

## Conclusion

These 10,000 years Old Stone Age city was following the urban planning definition of Jane Jacobs', This Urban Neighborhood, facing east, for views and sun. These were mixed used neighborhood, residential purpose with, a common front street. The precision of orthogonal shaped rooms, based on grid plan with columns, doors, windows, wall and stairs which are five architectural elements qualifying this planning as mature architectural features. Therefore it could be inferred that this is the first city in the human history.

The five –P: People, Place, Power, Politics and Product-ability factors are reason to be the key motivation behind grid. Primarily the power of people are overlapped to built a grid pattern modern city, secondly there is need of availability of sufficient land, thirdly desired intention for expendable and navigational grid city plan, providing security along with set of desired infrastructure. These five P: criteria qualifies Greek grid iron plan, Indus Civilization grid plan, Mehargarh grid planning as well as Cave Dwelling grid planning fit to be called a modern grid towns. The gird was not a coincidental design coming up all of the sudden in 2500 BC at Indus Valley, though it is deeply rooted in Ancient Sindh planning strategies dating back to 10,000 years ago. Conclusively we proved that the Urban Grid was been used by the 10,000 years old cave civilization, and it qualifies according to all the definition to be called a city.

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## Shah Burj - Shish Mahal at Lahore Fort

Saleem Ul Haq, and Architect Maqsood Ahmad

### *Abstract:*

*Lahore Fort is said to have been built when foundation of the city was laid. It has witnessed numerous important events and has remained temporary abode of many rulers. However, the credit of construction of the fort and its different important buildings in the present form certainly go to the Mughals. It is thus the foremost Mughal monument of Pakistan, imbued with layers of historical and spiritual meaning visitors. Inside its walls are preserved numerous examples of the apogee of Mughal arts, building crafts and architectural skills in a single complex, enriched by temporal depth and continuity from prehistory to the present. The changing and evolving styles throughout the period and into the Sikh and British eras are richly preserved. The most unique and exquisitely decorated majestic palace known as Shah Burj or Shish Mahal was built by Emperor Shah Jahan. It is situated in the extreme north-west corner of the Lahore Fort. The Shish Mahal (palace of Mirrors) is one of the most profusely decorated palaces of Mughal period. Built by Emperor Shah Jahan in 1631-32 A.D. under the superintendence of Asif Khan it formed the Harem portion of the Fort. The main decorative features include (i) the Aina-kari or the mosaic work in convex mirror glass (the so called Aleppo glass) with munnabat kari or stucco tracery (ii) pietra dura (inlaid floral patterns in semi-precious stone on a marble background) specially in the spandrels of the arches and on the bases of the double columns carrying superb multi cusped arches and (iv) the marble screens of extraordinary beauty and perfection skillfully carved in geometrical and tendril designs. The chambers were originally decorated with the fresco paintings and gilding but later on glass-mosaic work executed on the walls. The paper gives an indepth overview of this important monument and the challenges through which it went and which still exist.*

**Key words:** Lahore, Fort, Shah Burj, Shish Mahal, Shah Jahan

Lahore Fort was built as early as the city itself and first authentic reference to Lahore Fort has been made by Al-Biruni in the 1021 A.D. the fort was ruined by the Mangols in 1241 A.D. but was re-built by Sultan Balban in 1267 A.D. it was again destroyed and plundered by Amir Timur's Army in 1398 A.D. and again built by Sultan Mubark Shah in 1421 A.D. Mughal Emperor Jalaludin-Akbar demolished the earlier mud structures and built it in burnt brick masonry some time before 1566 A.D. and the same is thus referred to by Abu l Fazal in Ain-e-Akbari:-

*"Lahore is a large city in Bari Doab. In size and population it has few rivals in old books it is called Loawar. It lies in longitude 74o 39', and latitude 31o 45'. In this everlasting reign the Fort and palace have been built of burnt bricks. As it was for some time the seat of Government, lofty edifices were erected and delightful gardens added to its beauty".*



A view of the Lahore Fort & Hazuri Bagh



Layout of Lahore Fort Monuments

Lahore Fort is the foremost Mughal monument of Pakistan, imbued with layers of historical and spiritual meaning for locals and visitors alike. Inside its walls are preserved numerous examples of the apogee of Mughal arts, building crafts and architectural skills in a single complex, enriched by temporal depth and continuity from prehistory to the present. The changing and evolving styles throughout the period and into the Sikh and British eras are richly preserved. Individual elements are spatially arranged according to a set of archetypal Mughal design principles: a series of chahar-bagh quadrangles presenting a balanced formal composition of space, water, vegetation and architecture, texture and colour, light and shade, designed to divide space into public and private and to provide physical and symbolic transitions between them.

In addition to providing an oasis of green and calm in the crush of urban Lahore, the site has great didactic potential to teach all ages about the wealth of the past and its relevance and value to the present and Future.

The present configuration of Lahore Fort can justifiably be attributed to the master of fortification planning, Jalal-ud-din Muhammad Akbar. From its planning and its extensive use as a royal residence, it is clear that the site was envisaged as a fortified palace rather than a defensive Fort. All the three Mughal emperors, Akbar, Jahangir and Shah Jahan, concentrated on building exquisite palace structures after the first fortification walls had been constructed to secure the perimeter of the citadel. Later on Akbar's successors Jahangir and Shah Jhan and Aurangzeb added several precious architectural buildings to the Fort.

The Lahore Fort has some 21 monuments in it; most of them are on the northern side. These magnificent jewels of architecture are Shish Mahal (mirror palace) Naulakha Pavilion, Diwan-e-Aam, Diwan-e-Khas, Jahangir's Quadrangle, Shah Jahan's Quadrangle Moti Masjid, Makateeb Khan, Masti and Alamgiri Gates etc.

Lahore Fort was protected under the Ancient Monuments Preservation Act 1904 vide Notification numbers of its protection is 2524 dated: 27-01-1920. The historical and architectural significance of the Lahore Fort have been acknowledged and was inscribed on the World Heritage List, in 1981 and the Lahore Fort was put on the list of World Heritage Sites in Danger on 2/12/2000 due to serious damage to the mirrored ceiling of the Shish Mahal.

## Shah Burj – Shish Mahal

This most unique and exquisitely decorated majestic palace was built by Emperor Shah Jahan situated in the extreme north-west corner of the Lahore Fort. The Shish Mahal (palace of Mirrors) is one of the most profusely decorated palaces of Mughal period. Built by Emperor Shah Jahan in 1631-32 A.D. under the superintendence of Asif Khan it formed the Harem portion of the Fort. The north or back wall in the central chamber consists of large marble screen tastefully carved out in tendril designs.

The main decorative features are (i) the Aina-kari or the mosaic work in convex mirror glass (the so called Aleppo glass) with munnabat kari or stucco tracery (ii) pietra dura (inlaid floral patterns in semi-precious stone on a marble background) specially in the spandrels of the arches and on the bases of the double columns carrying superb multi cusped arches and (iv) the marble screens of extraordinary beauty and perfection skillfully carved in geometrical and tendril designs. The chambers were originally decorated with the fresco paintings and gilding but later on glass-mosaic work executed on the walls.

There is a spacious courtyard in front of the chambers. Its floor is paved with stone slabs of various types of variegated marble such as Sang-i-Badil, Sang-e-Abri, Sang-e-Musa, Sang-e-Khatta etc. In the centre of the courtyard there is a shallow water basin, round in shape. A mahtabi occupies the centre of the basin. Four fountains play in the basin. Four water channels paved with Sang-e-Abri (variegated marble) perhaps carried water from the basin underneath principal buildings to keep them cool.

The term “Shah Burj” is also found in the travel account of Manucci, in the following passage: - “There are in the empire three principal imperial abodes the most ancient is at Delhi, the second at Agra and the third at Lahore. At each there is a great bastion named the Xaaburg (Shah burj) which means ‘Royal Bastion’. They are domed and have architectural adornments of curious enamel work, with many precious stones. Here the king holds many audiences for selected persons, and from it he views the elephant fights and diverts himself with them”.

In his account of the Shah Burj the court chronicler notices first of all the large hall, now known as Shish Mahal, which occupies the north side of the square. It was here that in March 1849 the sovereignty of the Punjab was assumed by the British Government, as is recorded on a tablet into the wall. As mentioned above, it is built on a semi-octagonal plan. Its longest side, facing the square, has a row of double pillars of inlaid white marble forming five archways surmounted by eaves of the same material. Internally the spandrels over the arches are decorated with pietra dura which has fortunately escaped the vandals who have systematically mutilated this kind of work in other buildings. The graceful vine patterns over the two outer arches deserve especial notice.

The main room, a rectangular hall of noble dimensions, has a dado of white marble, while the upper portion of the walls and the ceiling are decorated with its name of Shish Mahal or “place of Mirrors”. This name, be it said, is not mentioned by “Abdul Hamid, who speaks of the building simply as a hall (aiwan). He refers to the mirror ornamentation under the curious name of “Aleppo glass”. It will be remarked that this decoration belongs to two different epochs. The ceiling with its prevailing aspect of subdued gilt undoubtedly belonged to the original edifice. It is rich without being gaudy. The wall decoration, on the contrary, is decidedly vulgar, and the introduction of fragments of blue and white china bears testimony to a childish taste. It is typical Sikh work and, if any further proof is wanted of its age, it may be noted that, when sometimes back a part of the glass-work peeled off, the wall beneath was found to be painted. But it appears that this wall painting, also, dates back only to Sikh time.

The roof of the Shish Mahal is encumbered with a curious medley of structures dating from the Sikh period. The small building which occupies the centre of the roof was built by Maharaja Ranjit Singh. The rest is said to have been added by Sher Singh, except the pavilion in the south-east corner which is ascribed to Nau Nihal Singh.

As we know that after Mughals the buildings in the fort remained under use of Governors and Viceroy of Lahore. Maharaja Ranjit Singh used the place for his regular residence and partly to meet the Sardars. Court work outside in eastern portion and frontal area. Subsequently on take over by the British it was put to multipurpose uses, including residence of the Garrison Commander. On a survey of the fort buildings in 1902 by the Archaeology Department the Shish Mahal palace was found to be in precarious condition which was in need of immediate repairs. The condition of the ceiling of the large room was found to be very serious, and operations commenced in 1905 to strengthen the same. Part of the decorative plaster had already collapsed. The wooden girders were in an advanced state of decay. The principal work was strengthening the old wood beams carrying the ornamental lathe and plaster ceiling. The problem, with great difficulty, was solved by suspending the beams in iron stirrups attached to the roof trusses above. The lathe and plaster roof where cracked had been attached to the old wooden beams by means of bastions at the end of strong wire. These repairs were invisible from below. Considerable repair had also been effected to the ceiling of the glass and gold but more was to be done. The holding Durbars of Governors and Viceroy during British period were also a regular feature at the palace. The excessive use of the building and its poor maintenance rendered the building dangerously repair worthy. The wooden beams had become empty shells and all that could be done to keep them in position was to prop them from underneath. The mirror work in the palace was the best of its kind. It was a class of decoration which appealed strongly to the vulgar taste of Sikhs who frequently imitated it but they could not achieve harmonious effect. Unfortunately again these days a part of the roof is on scaffolding with foam to hold the decoration work lest it comes down. But it so appears, it will happen, as no expert treatment is expected.

### **Naulakha Pavilion or Bungla**

Lying within Shish Mahal and popularly called Naulakha or the edifice which cost nine lakhs, it is a dainty little marble pavilion of chaste workmanship renowned for its extremely minute and delicate pietra dura work wrought in semi-precious stones such as agate, jade, gold stone, lapis-lazuli. It is noted as one of the finest architectural achievements of the Mughals in the sub-continent.

According to Dr. Vogel, the author of the *Badshah Nama* notes that on the west side of the Shah Burj “a pavilion of marble, whose mosaics of cornelian, coral and other precious stone excite the emulation of the workshop of Manes. This building is evidently the open pavilion now known as Naulakha. This name so the tradition affirms refers to its having cost nine lakhs of rupees. But the court chronicler mentions neither the name Naulakha nor the extravagant sum which would account for it. We may, therefore, assume that both the name and the supposed tradition are comparatively modern. Apart from such minor additions, Sikh rule has not materially interfered with the buildings of the Shah Burj and from the subsequent military occupation it has suffered less than any other part of the Fort. Thus, we have this interesting corner of Shah Jahan’s palace still practically in the same conditions as it was described by his court chronicler.

If we retrace our steps to the adjoining court and pass through the marble gate mentioned above, we enter a rectangular court-yard which contains a little temple of the Sikh period. Another gate on the north side of this square brings us to the top of a flight of stairs which, after making of this square brings us to the top of a flight of stairs which, after making two right-angle turns to the left, leads down to the Hathi pol or Elephant Gate.

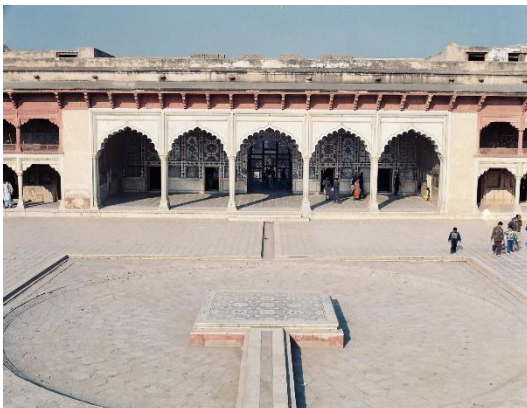
From this point we can conveniently start our survey of the tile decoration which covers the west and north front of the Fort wall’.

### Athdara

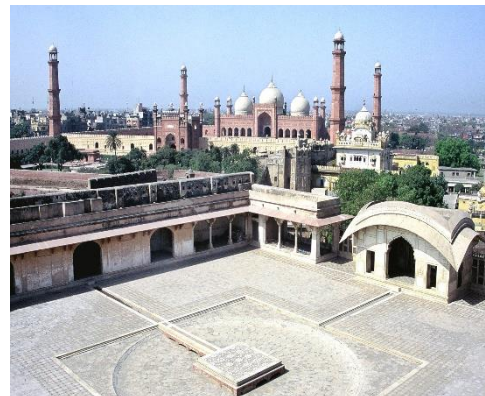
It is open pavilion dating from the reign of Ranjit Singh and was used by as a Kachahri or court of justice. The combination of white marble and red sand-stone brackets, and marble, and marble trellis screens with red sand stone posts (mutaakka) in the ornamental railing placed on the roof of the building clearly indicate its Sikh origin. The curious frescoes on the north wall, relating to the legend of Krishna, are the work of one of Ranjit Singh’s court painters.

### Shish Mahal

Although each and every building in the Fort is a fine specimen of architecture of the time but that which is situated in the north-west corner known as Musuman/Shah Burj/Shish Mahal is a most prominent and precious jewel in this crown. Shah Burj is a unique profusely decorated palace. Most prominent and most precious and unique jewel in this crown is Musuman/Shah Burj (Shish Mahal) is situated in the north-west corner and is one of the unique profusely decorated palaces in the world, built by Emperor Shah Jahan in 1631-32 A.D. It formed the harem (private) portion of the Fort. The palace consists of a spacious lofty hall in front and several rooms behind and on either side. The north of the back wall in the central portion consists of large screens tastefully carved out in tendril design.



Main Hall and Central Pool of Shish Mahal’



South West Corner of Shish Mahal’s Courtyard

The main decorative features of Shish Mahal are (i) the Aina Kari or convex glass mosaic work with Munabat kari or stucco tracery (ii) gild work (iii) pietra dura work, specially in the spandrels of the arches and on the bases of the double columns carrying superb multi-cusp arches; and (iv) the marble jalīs (screens) of extraordinary beauty, perfection and skillfully carved in geometrical and tendril designs. The chambers were originally decorated with fresco paintings and gilding but later on glass mosaic work was executed on the walls.



Main Hall of Shish Mahal



North Wall of Main Hall of Shish Mahal

## **Present Condition**

### **Entrance Gateway to Forecourt**

Inside the reception gateway of the forecourt to Shish Mahal, fresco painting work in floral & geometric designs and plaster work, Red sandstone work is visible which was mostly done under the 1974 master plan. The fresco works repaired/restored are of poor taste and have not executed with true spirit of conservation and following the international standards & Mughal methodology.

### **Forecourt**

In the forecourt presently cement concrete floor exists without any top finish and a well in the eastern half. On the Eastern Side original Mughal wall which half domed arches and niches with partial repairs from time to time is visible. At some areas salt affected naked brick work without plaster is existing. Certain portion of south eastern wall is missing. In the center pigeon holes similar to chini khana in Shalamar exist.

On the West Wall almost in the middle, once the original entrance of the Sheesh Mahal existed. Now the Ath Dara which acts as throne of the Ranjeet Singh and on its front there still exists Mughal period platform which was used as a landing place has red sandstone arcades on both sides. Its ceiling is newly restored by the Govt. of Punjab in the year 2008.

On the North Side is a parapet wall with small and large panels having terracotta jails which are approximately 2 meter high. On the South Wall in the centre reception gateway and arched paneled wall. It is thoroughly repaired from time to time. At certain places fair face brick work is visible.

### **Sothern Dalans**

South eastern and south western corner chambers of the southern dalans are having marble pillars carrying the red sand stone shades (eaves), lintel, and brackets. This eave is thoroughly restored and only few original elements like brackets, lintels exist at site. The tessellated flooring restored in 1996. VIP bath rooms are locked. The structure is sound. The south side walls of the south-eastern pavilion are roughly plastered without any finish. Tarseem bandi/ wooden decoration on the ceiling is partially restored/conserved in 2005. Its roof top is also conserved by replacing the damaged wooden beams/battens and proper drainage system.

Central portion of southern dalans is in stable condition. Sikh and original Mughal period paintings on the southern wall are visible. In the centre of the southern wall Mughal period cascade in zigzag pattern laid in variegated stones with water tub exists. In the ceiling plane wooden strips have been used. Sikh period paintings with human figures and geometric designs on the walls. In 1996 flooring was replaced with red sandstone slabs.

South west ceiling needs to be not in a good state of conservation. Needs to be studied for its proper conservation / retreatment. Walls are plastered from Sikh period. On Dado level lime plaster with three layers of yellow and black paint is an imitation to give it marble looks.

### **Western Suites**

South western pavilion of the western wall was closed before 1995. Since Sikh period similar to the pavilion on north western side this was revived as per Mughal design. Ceiling was restored with oil paints. It's an example of hasty conservation. It's completely restored without following the principles of conservation. It was a political decision to open it for Lady Diana in the 1990s.

Jalies on the south and north side of Naulakha are in a good state of conservation. All the pieces seem to be original except small repairs. In the Naulakha pavilion only few original panels or pietra dura works exists on the facades of it. The remaining facades have been covered with simple marble slabs. Eaves are clamped by iron strips which is a good example of reversible conservation. On the top parapet partial original features are still surviving and the remaining have been finished with simple marble slabs. In the interior flooring is of 1996. It's restored up to the door level. At Dado and above panel frame decoration with pietra dura works still exist. Above the door level walls are from Sikh period, now part of history still exists.

North western pavilion was in the use of ladies. It carries all Sikh period additions except eastern side marble façade. Remaining three sides are Sikh period additions including the ceiling work. Central portion of the ceiling is in dilapidated condition, needs to be repaired. Wooden beams and visible termite need to be studied and repaired. Flooring is red sand stone.

### **Courtyard**

North east and south western floor have been comprehensively restored with Sang e Badal (Jasper stone), Yellow and Black marble, but in south eastern and north western parts of the courtyard have mostly original Mughal period flooring with certain repairs and preventive measures of conservation applied from time to time. Sang e Badal expands in summers and contracts in winters so there used to be water channels beneath the floor at the uniform intervals.

In the centre of courtyard a Circular water pool with central platform (Mahtabi) exist. The floor of the pool having cracks and causing seepage below. The platform was restored in various stones in geometric patterns. There is a tank under the platform with opening on all four sides but now closed due to one or the other reasons. The water storage below the platform was for reuse of water for basement of Shish Mahal and excess water drainage. The floor of the Main tank needs to repair on top priority and the hydraulic system needs to be repaired.

## **Main Hall of Shish Mahal**

In early 1904 it was detected that the building (Shish Mahal) had developed some problem but as the reports go the work on Muslim monuments done by Punjab PWD was really edifying and this too was surmounted with success. The foundations of Naulakha pavilion had subsided, causing the holding to crack and bent dangerously outward over the edge of fort wall. The weight of the west wall of the pavilion which was resting mainly on a perforated screen was transferred to iron rails embedded in its masonry, while the screen itself has been taken out and reset. The whole thing being so cleverly done that it would be difficult to detect any change except for the fact that the cracks in the pavilion are no longer gaping open.

The ceiling of main hall of shish Mahal was sagging since long and in 1996 a committee was constituted to analyses and its proposed remedy. Finally in 2003 a project was started by UNESCO, department of Archaeology & Museums with generous funding of Government of Norway. The ceiling was stabilized by the national and international experts. The mirror work in the missing ceiling are yet to restored and conserved. Presently general visitors are not allowed to enter in the main hall of shish Mahal.

## **Summer and winter pavilions on north-eastern side**

The lower dado work and walls are in quite stable conditions and were scientifically cleaned by the departmental laboratory staff and a necessary repair to dado work was done under UNESCO project. The fresco work was also cleaned. There are certain cracks on the ceiling of the north east summer pavilion. The north east winter pavilion is also in quite stable condition. The mirror work was also cleaned. The necessary repairs to dado and floor was made in 2006.

## **Summer and winter pavilions on north-western side**

The lower dado work and walls are in quite stable conditions and were scientifically cleaned by the departmental laboratory staff and a necessary repair to dado work was done under UNESCO project. The fresco work was also cleaned. The North West winter pavilion with fire place, is also in quite stable condition. The mirror work was also cleaned. The necessary repairs to dado and floor was made in 2006.

## **North-western mezzanine floor**

The ceiling of North-western mezzanine floor was in dilapidated condition due to the decay of beams. The decayed / termite eaten beams were replaced and stabilized and finally the restoration of missing Terseem Bandi was done in 2005-06.

## **Causes of Decay**

All the materials used in the construction of historical buildings undergo deterioration when exposed to aggressive environments. The rate and symptoms of such a process are influenced by a number of factors, including the properties of material itself, the natural factors and human- actions. These factors either act separately or in various combinations. Conservation refers to systematic measures taken to keep the monument in good condition. It is the action taken to prevent decay. It embraces all acts that prolong the life of our cultural and natural heritage, the object being to present to those who use and look at historic buildings with wonder, the artistic and human messages that such buildings possess.

The Sheesh Mahal (The Palace of Mirrors) is more than 375 years old. Several times, since its construction, it has gone through various repairs and restoration work. The nature of restoration work included the restoration/repair of monument, mirror & tracery work, stone flooring, ceilings, roof tops, Red sand stone, marble elements including surface decorations and some facades of main building.

An examination of the building has shown that there is no single cause responsible for the deterioration and decay of Shish Mahal. It has been found that there are a number of intrinsic (internal) as well as extrinsic (external) causes responsible for the decay of the building. Of the causes of decay in Shish Mahal, the most uniform and persistent cause can be referred to as gravity, followed by the actions of man and then by diverse climatic and environmental effects – botanical, biological, chemical and entomological. Also, human causes produce the greatest damage. Thus, the major causes can be grouped as:

1. Causes, related to geographical location of building, such as thermal movement, rain and moisture and natural disasters
2. Causes related to nature of ground.
3. Causes related to materials and techniques used in original construction.
4. Man-made causes which include willful destruction, neglect, atmospheric pollution, vibration, wear and tear by visitors and use of poor conservation techniques.
5. Biological and Micro-biological causes.

### **Natural Agents of Deterioration and Loss**

#### **1. Natural Disasters**

Nature's most destructive forces are categorized as natural disasters, and include earthquakes, severe windstorms, floods, Extreme thermal Variations, fires caused by lightning, and so forth. Throughout history, they have had a spectacularly destructive effect on Lahore Fort and thereby Shish Mahal.

#### **2. Climate**

After natural disasters, less drastic agents account for the normal and often prolonged attrition of cultural property. All these factors fall under the general heading of climate. Climate is the consequence of many factors, such as:

- radiation (especially short-wave radiation like UV and NIR),
- temperature and extreme thermal variations,
- moisture in its many forms – vapour clouds, rain, and groundwater,
- wind,
- sunshine

Together these environmental elements make up the various climates of Pakistan which, in turn, are modified by local conditions such as proximity to bodies of water or cities (in this case Lahore), to create a great diversity of micro climates within the overall macro climates.

Note that in general, climatic data as recorded in the form of averages does not really correspond to the precise information needed by the conservationist, who is more interested in the extreme hazards that will have to be withstood by the building over a long period of time. However, if questions are properly framed, answers that are relevant to the particular site of the building in question can be provided by an expert in applied climatology.

### **3. Human Factors**

Man-made causes of decay need careful assessment, as they are in general the by-product of the industrial productivity that brings us wealth and enables us to press the claims of conservation. They are serious and can only be reduced by forethought and co-operation. Neglect and ignorance are possibly the major causes of destruction by man, coupled with vandalism, pollution. It should be noted that the incidence of inflammable can also a prominent factor, but has been kept in check by the installation of security cameras at key points. Poor conservation in an unplanned way and Lack of proper monitoring and management are also main causes of deterioration of this unique monument. Although during the recent years development of Master Plan by the UNESCO, the monitoring and management performas were designed for better preservation and up keep of the monument, which are never been used by the Department.

### **4. Additions , Alterations and interventions**

One of the major factors of decay for Shish Mahal are the additional constructions carried out mostly during the Sikh rulers of Punjab on the top of the original structure which add to the dead load that made the structure vulnerable to collapse. In 1904-05, the plaster from the ceiling of main veranda fell apart, exposing the decay of internal wooden beams and the corroding roof. At this stage, the building was listed by the department of archaeology of British India in 1927 and the repair work was carried out. Similar problems arose in 1960s and were resolved through minor repairs. In 1975, Shish Mahal was listed as a protected monument under the Antiquities Act by Pakistan's Department of Archaeology whereas in 1981, as part of the larger Lahore Fort Complex, it became inscribed as a UNESCO World Heritage Site. It was not until 2006 that the problems of the ceiling were comprehensively resolved and the structure was restored.



## **5. Political and Administrative Factors**

In 1991, in anticipation to various VVIP'S visits to Lahore, and thereby the Lahore Fort, a lot of faulty non-reversible conservation work were done on the ceilings of the Aath dara and south-western pavilions of Shish Mahal. That and government interference in the actual conservation process, or pressure to conform to unnecessary time limitations are key hurdles in the uniform and effective conservation of the building. Furthermore, the monument's basement (or sub-level chambers) was used as a material depot for a Government Civil Defence organization which caused a lot of wear and tear in that particular portion, evidence of which can still be seen. There was an effort to transform the lower ground chambers into a museum and a lot of shabby electrical wiring and similar work was done which further damaged the walls and plaster in those areas. The recent fresco paintings & Brick imitation work on the façade of reception Gateway which is done in a hasty manner does not reflect the true restoration but is just seems additions. The restoration work carried out in 1974 inside the reception/forecourt Gateway was a sample of poor conservation and is either peel off or fallen at places.

## **6. Atmospheric Pollution**

Air is polluted primarily by automobile exhaust emission and industrial waste products. Lahore Fort is located on southern side of GT road and close to Minar-e-Pakistan and Badhshai Mosque which is a busy traffic area at the best of times. In recent past the main Bus stand (Lari Adda) was shifted from Lahore Railway Station. During the recent studies by the Town Planning Department UET, it was revealed that more than 125,000 light and Heavy vehicles daily passes through the GT road passing on northern side of Shish Mahal and Fort. Because of air-borne pollutants, the surface of stone has become roughened, pitted, and suffering from marble diseases.

Pollution has greatly affected the stone especially , surface decoration like Fresco painting, mirror work, wooden element, red sand stone, "sang-e-badal" and marble. Lime mortar and lime plaster is also affected by pollution, with the change of calcium carbonate into calcium sulphate, which is water-soluble. Lime mortar is also leached away by acidic rains. The suspended particulates such as dust, fumes, soot etc. further add to the disfiguration of the surface of stone, especially fresco work on the walls.

## **7. Wear & Tear by Visitors**

Due to lack of defined visitor plan/ rout a large number of un organized visitors every day visit the Sheesh Mahal and inadequate number of watch and ward staff, are very common reasons of wear and tear of the precious monuments and its elements. The visitors often damage the monument by inscribing on walls, climbing into forbidden portions of the building, littering the area etc. As per data collected for master plan, about 85000 to 102000 visitors daily visit to Lahore fort.

## **8. Botanical causes of Decay**

The growth of autonomous plants in the immediate vicinity of the monument and other wild growth can cause damage if allowed to grow freely. These plants drive a bullet-headed root into crumbling masonry and cause disintegration. Indeed the evidence of growth often indicates that the pointing has perished, in which case it should be renewed as soon as feasible, incorporating a toxic agent in the mortar if plant growth is a constant nuisance. In certain cases the parapet of Naulakha and some portion of southern dalan of shish Mahal including the outer northern wall has been damaged either recently of in past.

## **9. Biological and Microbiological causes of Decay**

Bacteria and lichens can cause the decay of building materials by producing acids which react chemically with the structural material. Examples of this are sulphate-producing bacteria which grow on stone and lichens and mosses which produce acids that attack lead and also low-silica glass. Algae, moss and lichens all grow on brick and stone masonry and build up humus in which larger and more damaging plants can grow. Fungi and lichens also blacken entire walls and their enzymatic activity of can result in loosening, staining cracking and falling of building material if left unchecked.

### **Critical Causes of Decay of Shish Mahal:**

In the light detail analysis on the basis of physical Survey, it was revealed that various Structures of Shah burj/Shish Mahal are deteriorated or damaged due to general causes, but the most serious / critical due to:

#### **i) The action of water**

Apart from the action of rainwater and moist wind, the presence of water in any form accelerates the decay of most of buildings. The rainwater is more destructive exceptionally heavy downpour in monsoon season. Original storm water disposal system is inefficient causing water penetration in the structure resulting deterioration of structures. Some of the later period addition has also disturbed the drainage system of Mughal period. The most of the structures inside Shish Mahal like Main hall, southern and northern dalans has suffered a lot due to unplanned or insufficient water disposal arrangements.

#### **ii) Effects of Temperature Variations**

In Lahore the temperature varies from Zero C in winter and up to 48 C in summer. As all the building materials expand in when heated and contract when heated this thermal expansion and contraction causes thermal movements in the structures, causing stresses in various components of the buildings. These thermal movements are serious cause of deterioration in the structures and elements of Sheesh mahal.

#### **iii) Insect Attacks**

All organic materials used in most of structures in Shish Mahal are vulnerable to insect attack and causes tremendous amount of damages by weakening the wooden structures, special mention here to be made to termites or white ants because the harm they do is not externally visible until too late to be repaired. In country like Pakistan where all sorts of climate are can be found round the year, a wide range of wood eating boring insects are found. The monsoon is the best season for termite to flourish and attack the various portions of Shish Mahal. In Shish Mahal, there are several instances of termites, woodworms, fungi and white ants which have caused immense damage to both structural and decorative work in the building, e.g., the wooden roofs and ceilings of Main Hall of Shish Mahal, north-eastern, south-eastern, north western, and the mezzanine floor's ceiling of north eastern chamber, and the roof tops of northern side rooms on top floor etc.

### **History of Conservation of Shah Burj (Shish Mahal)**

In 1904-05 when it was observed that the false ceiling of main veranda of Shah Burj (Shish Mahal) is being affected due to heavy dead loads added on it during the Sikh and British period. Moreover, it was also badly affected by lightening in 1904, the condition of the ceiling became very serious and an operation was commenced by the Archaeology Survey of India to strengthen it. Part of the decorative plaster has already collapsed exposing two wooden beams in an advance stage of decay and it was further observed that most of

these wooden beams were too rotten even to be support. They were in many cases mere empty shells, and all could be done to keep them in position to prop up them from underneath.

Later on these numerous losses in mirror work and much of the gilding of plaster has been loosed or damaged due to water seepage from roof top specially the area below the bottoms on the northern side of centre, which has suffered most of the ornamentation.

In that year 1904-05 the Archaeological Survey of India took some major steps to restore and preserve the damaged structure of Shah Burj (Shish Mahal). Although the problems of saving the ceiling of Shah Burj (Shish Mahal) with all its gilt and mirror work from the collapse was actual difficult task but was successfully done at that time. First the Archaeological Survey of India removed the concrete roof above to stir-up the timber beams of the ceiling although these were badly rotten.

The ceiling of main veranda of Shah Burj (Shish Mahal) has been repaired more than once that is 1904, 1905 and 1922 during 1963-64 and still on. Since then this false ceiling remained under observation of the Department of Archaeology but the position is going bad to worst day by day. In spite of the meager financial resources and a few conservation specialists, the Department of Archaeology and Museums took all possible measures for the proper preservation of this architectural gem. But at the same time it should admitted that such monuments of world heritage value cannot be brought back to their original glory with special reference to the conservation and restoration of diverse nature of decorative element and architectural features. The decorative elements used for their embellishments are of a highly sophisticated nature and without active participation and financial support of the international agencies it is difficult to accomplish this task in a befitting manner. The Department of Archaeology has been aware of the importance as well as magnitude of conserving preserving and presenting the Lahore Fort as one of the leading monument in Pakistan. The Government of Pakistan has done its best to preserve it by adopting the traditional and classical methods of conservation. Other than the routine maintenance and special repairs, some useful conservation work has been carried out under the Annual Development Programme.

The first Master Plan, prepared in 1973 and the Department of Archaeology and Museums did its level best to maintain and up keep this unique palace of Mughal era. Maximum possible additions and alterations made in the past after the downfall of the Mughal dynasty which were serious threat to it were removed to regain the lost glory of the palace of mirror. Its tessellated marble flooring in the main veranda and adjoining rooms have been restored according to the original pattern Naulakha, pavilion, tasbih khana in the south west and south-east of corner have also been attended for its flooring and marble screen to replace the Sikh period additions. The main courtyard of the Shish Mahal was also attended for its Sang-e-Badal flooring as per its requirement.

The roofs of the entire building were made water tightened along with kankar lime plaster applied to the wall etc. Some of the Ainakari along with gilding work was carried to the exiling of the main veranda. The original niches/panels in one of the main verandah were also opened by removing the later period addition to exposure the paintings underneath.



A View Of Aath Dara in Fore Court of Shish Mahal



Sikh Period Additions on the Shish Mahal

In 1991-92 some serious cracks in the ceiling were observed. This problem was getting more serious day by day, and for the immediate conservation and to avoid the serious danger the Department of Archaeology tried its level best to preserve such architectural jewels to maintain it for present and future generations. The Federal Ministry of Culture constituted a Technical Committee in 1997 to advise there Department of Archaeology for arresting the further deterioration of the ceiling and to suggest remedial measures to revive its original grandeurs.

Sir Bernard Feilden, Director Emeritus, ICCROM renowned conservation architect also visited Pakistan on the request of Government of Pakistan and UNESCO. In accordance with his recommendations, the Department of Archaeology and Museums propped up the sagged portion of ceiling on foam scaffolding on Hydraulic jacks temporarily and also an additional temporary roof has been provided to open the roof top of British period for study and Investigation purposes. Another mission from UNESCO visited Musumman/Shah Burj (Shish Mahal) and submitted their investigations Report on various materials in 1999.

Against this backdrop and with the demolition of the unique hydraulic works of the Shalimar Gardens, the Lahore Fort and the Shalimar Gardens (considered as one World Heritage site) were placed on the list of World Heritage Site in Danger in December 2000. In response to a call for emergency assistance from the Government of Pakistan, UNESCO and the Government of Norway offered technical and financial support for the conservation and preservation of the Lahore Fort – the conservation of the Shish Mahal being taken up as top most priority.

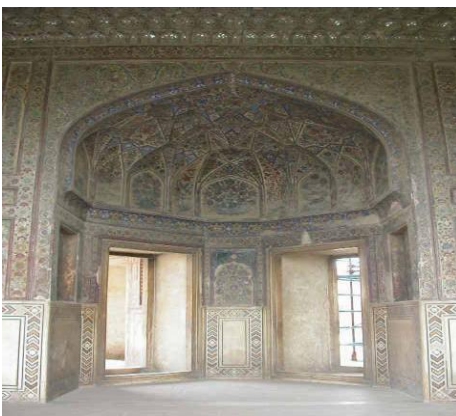
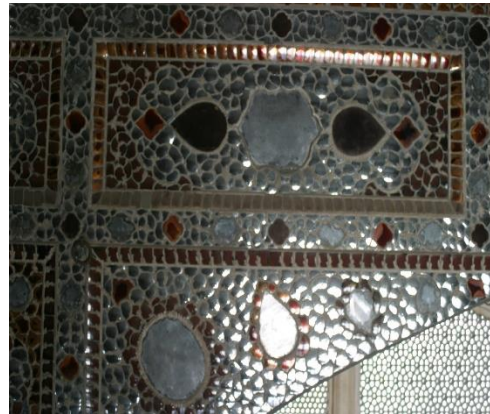
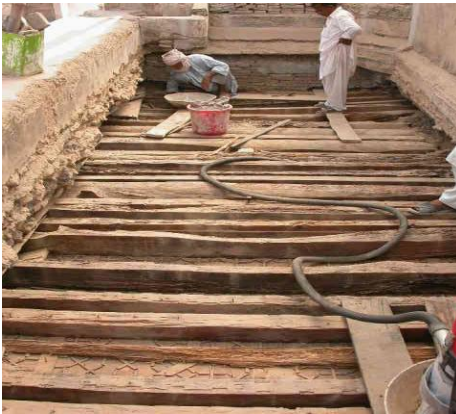
The first and second meetings of experts in May and August 2003, on the conservation of Shish Mahal was a sincere move by UNESCO, the Norwegian Government and Government of Pakistan to acknowledge the fact that the proficiency of architects, archaeological engineers, archaeological chemists, planners and other specialists in the field of conservation and exchange of other expertise provided a sustainable conservation strategy for Shish Mahal and on the recommendations of the of experts the conservation of Shish Mahal ceiling was carried out from 2003-2005.

#### **Past Preventive conservation carried out at Shish Mahal**

Since protection of the Fort, the following works of preventive conservation were carried out in the Shish Mahal.

1. The restoration of mirror work and Stucco Tracery work at the Shish Mahal ceiling was carried out. This conscientious work was of very deliberate nature and need full commitment and assimilation and consists of first aid to the damaged portion of the decorative work.
2. The cleaning of entire Shish Mahal was carried out including removal of grime, dirt and soiling is being undertaken by the female cleaning squad. The scientific cleaning of marble elements in the Shish Mahal.
3. In order to get available the trained hands for the execution of different decorative arts and crafts in the Shish Mahal, workshops for the training of various arts and crafts like Pietra-dura work, Stucco work, Fresco work and Tile Mosaic work were established in the courtyard of Shish Mahal.
4. The Tarseem Bandi of ceiling of South eastern verandah of Shish Mahal was conserved including the replacement of deteriorated and worn-out wooden battens/beams.
5. The Tarseem Bandi of ceiling of north-western verandah of mezzanine floor Shish Mahal was conserved including the replacement of deteriorated and worn-out wooden battens/beams.
6. The roof of the Sikh period chambers on the northern side of the Shish Mahal's present new roof was restored by the government of the Punjab in 2008.
7. The Roof top and tarseem bandi of the Aath dara outside Shish Mahal has also been restore by the Government of the Punjab in 2008.
8. The Façade of the Entrance gateway to fore court of the Shish Mahal has also been restored by the Punjab Archaeology in 2009. The Brick imitation and Fresco painting on Façade has also been done.
9. The joints of the entire red sand floor around the Main Mirror hall and southern verandah were treated with stained lime mortar and marble Dado panels of summer and winter pavilions were preserved with new marble motives to check further deterioration.
10. The roof top of North east pavilion (bathing area) was also restored and all the termite eaten beams were replaced by new ones after termite treatment.
11. The scientific cleaning of all the marble work, Aina kari, fresco paintings, and other surface decoration inside and outside the Shish Mahal was done by the Staff of Central Archaeological Laboratory. The Walls and Floors inside the Shish Mahal, and Walls of the fore court were cleaned by the Laboratory Staff and Women Squad employed during the UNESCO project from 2004-2006.
12. The Women Squad also cleaned the floors of all the structures inside Shish Mahal daily and also dusting of walls and decorative elements.
13. The joints of the floor of the fore court were treated with traditional mortar to check further deterioration.

### Photographs Showing Past Preventive Conservation Carriedout





## A Museological Survey in Balochistan: An Overview

Shakir Naseer, Waheed Razzaq and Farooq Baloch

*Abstract:*

*Balochistan, an archaeological and ethnological potential piece of land, with ancient and up-to-date mysterious geographical location, has always graced attention of the foreign and indigenous scholars. The foreign archaeologists have always shown great enthusiasm and interest to conduct archaeological surveys and explorations in Balochistan, ever since the British Colonialism. These foreign missions, had not been merely indulged in archaeological tours and excavations, but were also successful in discovering a great deal of antiquities. This first step was taken in 1875 by Major E. Mockler in the coastal areas of Makran division. In spite of the fact, until now there is not a well-arranged and documented museum in the entire province of Balochistan. If archaeologically seen, it should have been the home of all types of museums with its extraordinary rich archaeological contexts and findings. Unfortunately, today this archaeologically rich province is deprived of its own attained objects. It is strange to say, since 1900s until 1970s, Balochistan had merely two museums, namely McMahon Museum and Geological Museum Quetta. Consequently, Balochistan had been always over-looked both in terms of archaeology and Museology. At present, the so-called functional museums lack the concerned people, who can cope with the museum property in its museological context.*

**Key words:** Museum, Collection, Balochistan, Archaeological Museum, Ethnological Museum.

### Introduction

Museum is generally termed an organization dedicated to sharing information about a particular topic or topics, providing visitors with visual knowledge and experience leading to better understanding and appreciation. Every museum is different in functions and may similarly be in collection from one another. However, the general perception is that this is the archaeological collections which give the names to a building or place as a museum, although, regarding purpose and objective, they do vary from one another. This, however, does not mean that the term 'museum' is restricted to the collection of archaeological objects only. The numbers of museums in term of different categories may run in hundreds. Some examples may include Army Museum, artillery Museum, Navy Museum, Air Force Museum, Art Museum, Ethnographic Museum, Fashion Museum, Folk Heritage Museum, Geological Museum, Maritime Museum, National Museum, Natural History Museum, Palace Museum, Postal Museum, Private Museum, Public Museum, Prefectura, or Provincial Museum, Rural History Museum, Science Museum, Botanical Museum, Zoological Museum, Technology Museum, Textile Museum, Toy Museum, Transport Museum, Railways Museum, University Museum, Virtual Museum, Wax Museum, etc.

One of the chief aims of a museum is to preserve the collections. These collections are the trusts of ancestors and represent their cultural traits. The second objective of a museum is to exhibit and convey the cultural diversity of a region, culture, civilization, for the sake of studies and researches. This is also a source of caring and guarding the past left-over objects in order to study, interpret and reconstruct the past lifestyles and history of the primitive peoples including their socio-economic conditions, art, architecture, beliefs, governance and political structure, etc. These tangible objects interpret intangible activities and narrate true-life stories regarding their past lifestyles.

Unfortunately, Pakistan is not a country that is capable to create or produce different types of museums, such as period museum, ceramic museum, textile museum, and so on. In Third World countries if a museum is arranged with different sorts of collection then it sounds a lot. For better tracing of the history of a region, a museum plays a very key role to handover its past history empirically to its audiences. In a museum as a visitor moves on looking at different types of specimens, he/she automatically develops an image of their past way of life. A diorama in a museum remedies the answers of many mysterious events of the past.

### **The First Ever Concept of Museum**

According the Collins English Dictionary (8th Ed.) the word museum has been derived from a Latin word in 16th century museum, which means a set of collections open to the public. This collection contributes to general education as well as scholarly and scientific research. The history of first creative idea of constructing a museum goes back to the classical origins. The first suggested word for museum was a Greek origin mouseion meant “seat of the Muses.” This gave notion for the deities of arts and sciences chosen a philosophical institution as well as deemed a place of observation. (Lewis: encyclopedia Britannica) Whereas, ‘museum’ seems to have been limited in Roman times essentially places of philosophical debates. Ptolemy I Soter (ca. 367-283), was a Macedonian general of Alexander the Great, who founded the first museum of the world called “Great Museum at Alexandria” in the 3rd century BCE. At that time the interpretation of the preserved cultural heritage was focused on in the museum. (Flower 1896: 3)

### **The First Documented Museums**

Samuel Quickelberg, a physician of Amsterdam, published one of the earliest known catalogues of such a museum in 1565 in Munich. As a matter of fact, this was the first cataloging of a museum in the world. Soon in the following year, the collections of Johann Kentmann were published by Conrad Gesner. This collection consisted of 1600 objects and mainly comprised materials of minerals, marine animals, and shells (Flower 1896: 4). While in England, the earliest cataloging of a museum is of Musaeum Tradescantianum in 1656. These were the specimens of English John Tradescants, father and son, of Lambeth, London. Later on, this property was owned by Elias Ashmole in 1677. This collection was transferred into the University of Oxford. For this collection soon a building was erected and opened to the public in 1683. This museum is located within the premises of Oxford University and known by the name of Ashmolean Museum. (Boylan 2004: 2)



Fig. 1- Elias Ashmole (1617-92) and the Ashmolean Museum, Oxford (Courtesy: Encyclopedia Britannica)

## **The Role of Museum**

Taken as a whole, museum collections and their scientific display symbolize the world's natural and cultural common heritage. As organizers of this heritage, museums are subjected to streamline an understanding of all natural kinds of the human knowledge. The museums are important treasures for human beings in all their activities to promote knowledgeable gratefulness of the rich and different worlds we have owned. (AAM 2000: 5) The objects are required for a museum in order to create collections because the objects kept in the museum convey important messages to the visitors. These objects can be religious, historical, economic, ecological, political, technological, and so on. (Anno 2009: 2) Museums are just not only buildings rather they are treasure-houses of the past peoples. They house the remembrances of the world's peoples including their cultures, dreams, and hopes. Throughout the world, each year, millions of people visit museums. The visitors visit these museums owing to keen interest towards the old world. These collections and the number of museums of the whole types are burgeoning year by year. (Ambrose 2006: 4-6)

Furthermore, a museum is about to perform a pre-eminent duty to advance their educational role and attract the audiences from the locality, community, or other group they serve as well. It communicates with the other essential communities and promotes their cultural heritage as a fundamental part of the education. (ICOM 2013: 8)

## **The Development of Museums in Pakistan**

In European nations the pioneering idea of establishing museums commenced along with concept of the 'nation'. This concept was figured out at that time when they collected and displayed a large amount of tangible remains. These remains came through archaeological context as a shared heritage. (Kristiansen 1996: 89-100) Similarly, in the developing countries likewise, Sri Lanka, India, Pakistan, and Nepal the tendency of museum occurred recently. These established museums made a chain between past and present. (Khan 1972: 8)

The ever-first museum of South Asia was "Indian Museum," built in Calcutta in 1814. (Morley 1981: 10) During the middle of the 19th century museums were established rapidly with a larger number than ever before. But in the inception, these museums were provided with natural history collections. However, as archaeological researches were being conducted in the country, so shortly these museums were enriched with archaeological materials. In Pakistan the Victoria Museum was the first museum established in 1851. It was founded by Sir Bartle Frere at Karachi. (Habeeb 2000: 27) soon after, this museum was followed by the Lahore Museum in 1865-66, Peshawar Museum 1900 and McMahon Museum in Quetta 1906. (Dar 1989: 3) In fact, Peshawar Museum was mainly a museum of Gandhara Art with a large number of Buddhist sculptures on its exhibition. On the other hand, S. R. Dar writes that Sir Alexander Cunningham has mentioned the existence of a museum in Peshawar early in 1872. He stated this piece of information in the Annual Report of the Archaeological Survey of India, Vol. II, p. 125. Unfortunately, presently nobody knows the precise location of this mentioned museum. However, the first purely archaeological museum was established in 1918 under the supervision of Sir John Marshall. In fact, this was a site museum established in Taxila, Punjab aimed at housing the Hellenistic materials. (Dar 1981: 13)

## Museums in Balochistan

### The McMahon Museum, Quetta

The McMahon Museum was one of the important features of Quetta. This beautiful museum drew the attention of visitors either in one way or the other. This was built along with the “Sandeman Library”. This aesthetically glamorous Museum was situated between Bruce and Anscomb south of the “Sandeman Memorial Hall”, or “Jirga Hall”. The building with its five domes was a noticeable object, as experienced from the lovely Lytton Road; looking eastwards through the gateway of the Political Agent’s bungalow. While, the Murdar range of mountains in the background represented a picturesque landscape. Moreover, according to this locate on of that time, today it marks its place on the situation of famous Serena Hotel. It is subterranean on Shahrah-e-Zarghoon just apposite to the Cantonment area. According to the above mentioned geographic location, it fits the location of McMahon Museum. Secondly, during the constructional work of Serena Hotel, a magnificent glaring golden bull along with a bowl met to the workers. Later on, these two masterpieces were donated to the National Karachi Museum. But unfortunately, today these priceless golden specimens are not on the museum display.

### The first Idea of McMahon Museum

The idea of making a museum in Little London (sobriquet of the old Shālkot or Quetta by British colonists) came up with the application till the completion. This pioneering notion came on surface in 1904 when a question arose of erecting a separate building for the “Sandeman Libray”. This library was already founded in 1884. The constitution of Sandeman Libray came up under the patronage of Rai Sahib Diwan Jamiat, with the assistance of the late Sir Robert Sandeman and Sir Hugh Barnes. Concurrently, there emerged the question for consideration of beautifying Little London with a Museum.



Fig. 2- An old glimpse of the McMahon Museum before the destruction along with the Sandeman Library. (Courtesy: BSC, UoB, Quetta)

### The Construction of the McMahon Museum

The prime aims and objects of building two certain institutions being so closely interrelated with one another, arrived with a conclusion that they may be dealt with together and housed in a single edifice. Sir Major John Ramsay was the officiating Agent to the Governor-General in Balochistan, happily agreed with this view and obtained the necessary funds from the Government of India. (Cumming 1934: 5) the constructional works commenced in 1904 just after releasing the funds. These all works finished within a span of two years in 1906 along with its furniture, show-cases, and fitting works. (Dani 1970: 23)



Fig. 3- An aerial photograph of the McMahon Museum. (Courtesy: fb.com/archive 150)

### The Division of the Museum

In the inception, the museum edifice comprised merely four main rooms. The first room was devoted to the Sandeman Public Library, the second to a first-class Reading Room, the third to a Public Reading Room with combing the Museum, and the fourth was merely for Museum exhibits. During 1911 to 1912, the backyard of museum building was enlarged by the addition of two larger rooms. Among these rooms one was perhaps for Committee meetings and geological collection and the other accommodated archaeological, ethnological and miscellaneous articles. (Cumming 1934: 8) Simultaneously, then the Museum was given the title of “The McMahon Museum”, honoring the Honorable Sir Arthus Henry McMahon. He himself took a very keen interest in everything pertaining to the newly established Museum. (Cumming 1934: 7)

### The Reserved Collection

Eventually, the day came when on 16<sup>th</sup> October 1906, the Museum and Library building were formally opened to the public. (Cumming 1934: 6) The dearth for a museum felt when they

already had big collections of articles of historical and economic interest. Correspondingly these included coins, inscriptions, pottery and other specimens of local handicrafts, including carpets, and other materials of domestic use. These all cultural properties were collected in 1901 during the preparation of the Provincial Gazetteers of Balochistan and Balochistan Census Report. However, both were later on Published during 1905-1907. (Cumming 1934: 5) The other displayed museum assemblages were enriched by donations, gifts correspondingly natural history articles. Some other antiquities were discovered by the Archaeological Survey of India (ASI) during the course of excavations at Naāl (Khuzdar), Mastung, and some other sites. This museum came to destruction by the severe earthquake of 31<sup>st</sup> May 1935. It shook each and every building and converted them into ruins. Later some materials of the destroyed museum were shifted to the Staff College, Quetta. (Hughes 1915: The Indian Biographical Dictionary)



Fig. 4- The McMahon Museum in destructive form after the massive earthquake of 1935.  
(Courtesy: Cumming)

### **The Contributions of Mr. J. W. N. Cumming**

Mr. J. W. N. Cumming was connected with the province of Balochistan for nearly half a century. He was one of the planners of the organization known as the “McMahon Museum.” For a couple of years, Mr. Cumming acted both as Honorary Curator and Secretary of the Museum. Mr. J. W. N. was also appreciated by his services and contributions towards the Museum. He acted as the Managing Committee of the Museum, when in April 1914, a permanent Curator was appointed for the said museum. He has been working from the very first day of the museum in 1906, unless taking the museum institution into its zenith. (Rai, 1934: introduction note)

### **Quetta Geological Museum**

Respected Ahmad Hasan Dani writes, when it comes to museum then the whole Balochistan is blank. Further he says though many of this region’s priceless objects are not only displayed in Pakistan’s

famous museums, but also throughout the world. However, the Geological Survey of Pakistan had established a Departmental Museum in Quetta. Nevertheless, this Geological Museum was not opened to the general public. According to a letter dated to 26 September 1970, (letter no. MUS/2/65), the Geological Department forwarded the letter:



Quetta Geological Museum complex.

“This organization does not have a Museum in the sense as enquired in the questionnaire sent by you along with the letter under reference (questionnaire for the Museum officers No.1). However, we have a small museum of minerals and rocks for reference studies as well as to acquaint the public, college and university students, and high officials visiting Geological Survey of Pakistan, with the geology and mineral wealth of the country. A section of Museum also keeps fossils collected from various regions of Balochistan. We have been participating in the exhibitions and fairs held in the country where mineral, rock and fossil specimens found in the country along with some of the instruments used in the survey, search for mineral are displayed”. S. A. Naqvi, the Superintendent of the National Museum of Karachi, contributed to the Museums Journal an article in October 1957 (Vol. VI, pp. 51-59), with the title “Development of Museums in Pakistan”, in which we have the name of “Geological Museum Quetta. This was one of the other newly established museums in the subcontinent. (Dani 1970: 29) The museum was enriched with the artifacts of geology, paleontology, mineralogy, astrogeology, dinosaur fossils, Balochitherium, walking whale, Cain azoic mammal Quettacyon parachai, coll of Jurassic/Cretaceous Ammonites, meteorites, rocks and minerals, and precious stones. (Dani 1970: 39)



The vertebrate gallery displaying the fossils of Balochitherium on the floor level.

### **The Sub-Sections of Museum**

Currently this museum keeps seven galleries within the museum complex. The first gallery houses natural objects like rocks and minerals coming from various regions of Balochistan; the second gallery houses precious and semi-precious gem stones; the third gallery houses economic minerals like gold, copper, iron, zinc etc.; the fourth gallery contains building and decorative stones; the fifth gallery comprises of astrogeological materials likewise stony meteorites and comets; the sixth gallery houses paleontological remains and the seventh and last gallery is consisting of fossils which further includes two sub-sections: vertebrate and invertebrate sections.

### **Quetta Museum**

The Quetta Museum was established in 1971 along with the Directorate of archaeology and Museums in a rented Bungalow in Maikani Road, Quetta. This museum is also called the Museum of Directorate of archaeology and Museums. Afterwards, this museum was shifted to Mali Bhag. Third and last time it was shifted to Spini Road, at Noori Naseer Khan Complex. Nevertheless, this is not its permanent place hitherto. Right now two directorates are working in this complex i.e., the Directorate of Archaeology and Museums and Directorate of Library. Most of the antiquities of this museum have come through donations by the local people. In terms of antiquities, this museum is quite rich but unfortunately, many objects are not displayed yet. Some of the objects were lost and others remnant ones were shifted to Karachi Museum due to mismanagement and lack of permanent place of its own in Balochistan. They have temporarily settled their offices at this place but they do not have a permanent place for the museum too. This museum exhibits guns (called Dahdari guns because of their manufacturing in Sibi Dadar), manuscripts date back to ca. 1000 AH. 92 objects belong to Mehrgarh, among which include terracotta male and female figurines, animal figurines, polychrome wares, polychrome jars, and other types of pottery with various designs and motifs. At a time, there was also a horde of coins some local and foreign coins displayed in the museum. The local coins probably belonged to the Kalat Sate, while the foreign coins belonged to the Buddhist and Abbasid periods. Due to the access of transferring of objects from one place to the other these all coins disappeared finally.

Besides, there is no proper budget regarding the conservation and preservation of the museum's specimens. Currently the museum administration has made a new proposal for a new location of the Directorate of archaeology and Museums at Fine Arts College that consists of 25 halls. They have devised to establish 6 ethnological halls in this complex each for a separate division of Balochistan, including Quetta Division, Kalat Division, Sibi Division, Makran Division, Naseerabad Division, and Zhob Division. (Hussain 2014)



Fig. 5- The Display Hall of Directorate of Archaeology Museum, Quetta. (By researcher)

### **The Department of Culture Tourism and Archives**

The Department of Culture Tourism and Archives was established in 1971. There are five Directorates working under this institution that are its sub-branches, including Directorate of Culture, Directorate of Tourism, Directorate of Archives, Directorate of Library, and Directorate of Archaeology and Museums. The chief head of each Directorate is called Director and he is under the command of Secretary who is the Chief Head of all these five Departments. In Directorate of Archaeology and Museums only 24 local people are working while 54 others belong to the other three provinces of Pakistan, who came after the 18th Amendment. Among these, there none working in BPS-17 and above. There are four sub-branches of Directorate of Archaeology and Museums in Districts of Turbat, Gawadar, Sibi, and Ziarat. In the present developmental schemes under the planning of DAM, they are about to include- Kuzdar, Panjgur, and Las Bela districts. (Hussain 2014: interview)



Fig. 6- A profile view of the Directorate

Directorate of Archives, Archaeology and Museums complex. (By researcher)

### **The Directorate of Archives**

The Directorate of Archives was constituted in the year 1984. It aims at not only accumulating and preserving the discovered historical annals, but also caters to the needs to the research scholars in different fields of their interests. For the last nineteen years, the Directorate of Archives has been reprinting valuable and rare books. These include the outdated books, manuscripts, and letters. These all pertain to the cultural and historical heritage of Balochistan with a special background of information. (Khan, Habib Ahmad 2002: Foreword)

### **The Sibi Museum**

In 1903 the Queen Victoria's Memorial Hall was erected. After sometime then it was converted to Jirga Hall where all the tribal issues used to be discussed annually by the elders. It was given status of a museum in 1987 by the Federal Department of Archaeology and Museums. This historical and archeological site takes the central part of the Sibi district on the Neshtar Road just adjacent to the Governor house. Irshad Hussain from district Charsada, Khyber Pakthunkhwa, was the first curator of the Sibi Museum who is presently working as the Deputy Director in Taxila Museum. Muhammad Baloch from district Khairpur, Sindh, was appointed as the second curator for this museum, but he resigned soon and Muhammad Khan was appointed the curator of the museum. He also worked for a short span of time like Muhammad Baloch and resigned. Ultimately, in December 1990, Mahmood-ul-Hassan was appointed as the curator of the Sibi Museum. He was the only curator, who worked in this museum for the longest duration until its conversion into a "Jirga Hall" in November 1999.



Fig. 7- A fascinating and profile view of Sibi Museum. (Courtesy: BSC)

The collection in Sibi Museum comprised specimens of the three famous sites of Kachi Bolan, namely Mehrgarh, Nausharo, and Pirak. The museum consisted of a main central display hall with a corridor. The central hall was enriched with the excavated archaeological objects of the above three mentioned sites. The corridor was furnished with the ethnological objects and portraits of Quaid-e-Azam Muhammad Ali Jinnah. Jinnah himself visited this historical building as the first Governor General of Pakistan. However, these ethnological objects mainly included five Dahdari guns (the blunderbuss guns made in Sibi Dadhar), eight swords, and Balochi cultural dresses. The total objects displayed in the museum were one hundred sixty-eight.

In November 1999, the Museum was closed and the building was once again declared as the Jirga Hall. The whole objects of the Sibi Museum were shifted in the Karachi National Museum. But unfortunately none of these priceless objects are on the display; rather all of these findings have been dumped in the museum storerooms. (Mahood-ul-Hassan 2015: Interview)

#### **Quaid-e-Azam Residency Museum, Ziarat**

Quaid-e-Azam Residency, also known Ziarat Residency was erected during the British Colonialism. This building has the unique distinction to have been in use of the founder of Pakistan, Muhammad Ali Jinnah. This is spread over an area of four acres and situated in District Ziarat. This residency is in the north of Quetta at a distance of 65 miles. Prior to Partition of the Indian Subcontinent, the Chief Commissioner of Balochistan used to reside here during summer season. This is a two-story building built with baked bricks with wooden floor and balcony.



Fig. 8- The Quaid-e-Azam Residency Museum Ziarat after the restoration work. (Courtesy: FB)

This residency is housed in the valley of world's richest Juniper forest. It has four rooms. Moreover, this historic building was declared as a National Monument under the Antiquities Act of 1975 by the Government of Pakistan (Mumammad 1987:38). Many visitors visit this museum and enthusiastically look at the sophisticated objects used by Quaid-e-Azam Muhammad Ali Jinnah during his life. But unfortunately, this archaeological monument was put ablaze on 15 June 2013. It was restored and inaugurated on 14th August 2014 by the Prime Minister of Pakistan.



Fig. 9- the Quaid-e-Azam Residency after the attack. (Courtesy: google)

### Command and Staff College Museum, Quetta

The Pakistan Army Command and Staff College Quetta is regarded one of the high-status Pakistani military educational institutions. Here the officers are trained and educated. Basically it was established in 1905 at Deolali near Bombay, India and then transferred to Quetta in 1907. It is located at the entrance to the Urak Valley, Quetta. The College possesses a small museum inaugurated on 16th of May 1979. It houses a small private collection secured by El Alamein, who was an instructor there as is considered the hero of World War II. The private collection comprises various objects of interest and historical value pertaining to the College, like military objects, paintings and photos. There is no written record whether the transferred objects of McMahon Museum still exist in this museum or not. It is just because it is under the control of military and is highly restricted for a visitor without the military permission. (Ibrahim 2014: interview)



Fig. 10- Command and Staff College Museum Quetta. (Curtsey S. Naseer)

### Kech Museum, Turbat

Kech River is one of the largest rivers of Makran, thus, the old name of district is Kech probably taken from the name of Kech River. But later on possibly because of its geographical location it was named “Turbat” which itself means grave in Persian, probably because of the extreme heat of summer giving a deserted look like a graveyard. It was again renamed as Kech. Apart from this, Kech Museum is known in Balochi Kech Qadeem Ja, Qadeem means “old or ancient,” while Ja means “place,” so literally it means “old place” attributed to museum. Kech Museum is located in the main city of Turbat; just on the right side of National Bank of Pakistan.



### **History of the Museum**

According to the written records of late 1994 and early 1995, the current building of Kech Museum was the first rest houses of Kech used between late 1960s and early 70s. Until the beginning of 1995, it was not a functional museum and there is no evidence that any antiquities were on display. It according to the official documents of 2006, this museum was under the control of Department of Culture and Museums Government of Balochistan. There are several Directorates in the Department of Culture Tourism and Archives, and this museum was under the department of culture and Museums. (Ahmed 2014: interview)

In the boundary wall of Kech Museum there are 4 mud-rooms erected with a front corridor. In 2006, a museum staff comprising 6 persons was appointed for Kech Museum but without any particular office for the official works. Currently, Mr. Ayaz Ahmed is the assistant curator of Kech Museum since 2011. In response to a question he informed that, the former Director of Archaeology and Museums Balochistan, Noor Khan Muhammad Hassani, has once said all the valuable and precious objects of this museum were transferred to Karachi Museum due to its non-functionality and mismanagement. (Ibid., 2014)



Fig. 11- An aerial view of Kech Qadeem Jah (Courtesy: Google).

### **Gawadar Museum**

The Sultan of Oman, Sultan Qaboos bin Said al Said, directed the ministry of Heritage and Culture of Oman to restore the Gawadar Castle and convert it into a museum during his state visit of Pakistan in 2001. This was a political strategy to have a stronger reflection of the historical ties between the Sultanate of Oman and the Islamic Republic of Pakistan. On completion of the work, Mohammed bin Said Al Lawati, Sultanate's ambassador, handed over the key of Gawadar Castle on behalf of his Government in a ceremony at Pearl Continental Hotel. (Gawadar News and Business Source) On 20<sup>th</sup> March, 2007.

Gawadar Museum itself is an archaeological monument and still keeps its significance due to its impressionistic look and masonry (fig. 3). This museum consists of two types of galleries, i.e. Ethnological Gallery and Archaeological Gallery. The Ethnological Gallery housed the traditional objects of Oman State, such as daggers, swords, canons, and many more. The Archaeological Gallery displays the archaeological objects of two famous sites of Shahi-Tump and Miri Qalat, Makran. Presently, the rich cultural and historical museum has been abandoned and once again turned into a ruin because of mismanagement and lack of funds. Of the objects on display in this museum only one canon is visible in a corner of the museum in worst condition covered by thick layer of dust. (Razzaq 2014: interview)



Fig. 12- A beautiful view of the façade of Gawadar Museum. (Courtesy: Jehand Baloch)

### **The Balochistan Study Center Museum, UoB Quetta**

Balochistan Study Center (BSC) Museum was established in Arts Faculty Department, University of Balochistan, Quetta. It consists of merely a central hall without any particular galleries. This museum is furnished with show-cases, fixed in walls and arranged in the centre. The total wall show-cases are eight in number, four on each side. Further, each showcase is subdivided into two sections with a wooden column in the middle. In the central portion of the museum ten show-cases are displayed. Unfortunately, there is not proper lighting arrangement for the objects in the showcases. This museum is illuminated with the common fluorescent tube lights. Moreover, the objects on display have not come from one source but from various sources, such as donations, surface collections, and purchased objects.

The collection shows variety such as, ethnological, archaeological, natural, geological, and art specimens. Further, these objects have come from fifteen districts of Balochistan. Of the large number of objects only thirty objects have been provided with captions showing their proper provenance, while the remaining objects are on display without any proper captions. (Naseer 2014: 196-97)



Fig. 13- The display of the main central hall of the BSC Museum, Quetta. (By researcher)

### **Brief History of the Museum**

For the very first time in BSC Museum, there were just some four to five ancestral weapons donated by the Director of BSC Dr. Abdul Razzaq Sabir and Manzoor Ahmad Baloch. Dr. Sabir added in his interview, that from its inception in 1997 he was appointed as Acting Director of the newly established Research Center and due to non-existence of Museum Curator the Director was also the custodian of the museum.

Archaeological objects for the museum have been donated voluntarily by people of the area. The best collection ever donated was by Siddique Mirwani, Jahangir Marri, Bahram Khan Lehri, and Wahid Kethran. The other objects including both archaeological and ethnological have been donated by and through the personal efforts of Siddique, Habib Baloch, and Hameed Shawani (current Director of BSC). Farooq Baloch, Assistant Professor of History in the BSC worked day and night for the enrichment of this museum. He made extra efforts to collect many objects from people he reached through out the province. Farooq Baloch along with his team members of BSC contacted every person and every house where he could get hold of any cultural object and in the process also faced difficulties. (Sabir 2013: interview)

### **The Reserved Collection of BSC Museum**

The property of this museum is quite rich in terms of its well-known articles of Mehrgarh, Killi Gul Muhammad, Kulli, Naal, and some other Neolithic, proto-historic, Bronze and Iron Age documented and undocumented sites of Balochistan. This museum also houses the materials of those sites which were not surveyed and visited earlier by archaeologists. The total objects in this museum are around six hundreds, which include forty coins of Pre-Islamic and Islamic eras. The mentioned Museum collection also includes terracotta figurines, seals, Islamic manuscripts, fossils, potteries, water pitchers, terracotta bowls, earthenware jars, cups, plates, jugs, dishes of different designs like dish on stand with different motifs including (fish motif, bird motifs, geometric designs, emboss rope designs, Balochi dress-embroidery) seals, weighing stones, varied types of potsherd, ewers, statues of mother goddesses, male figurines, animal figurines, terracotta bulls, humped bulls, stone blades, jewelries including (bangles, necklaces, studs. Earrings), beads, sea shells, Islamic period swords, Sikh period daggers with sheaths, guns, a padlock, replicas of Chakar-e-Azam and Balochelites, and other household specimens. (Ibid. 195-96)

## Concluding Remarks

It is, of course, of great pride for the inhabitants of Balochistan that the ancient land where they are currently residing remained the abode of one of the earliest advanced cultures of the ancient world. This is the very place, where the primitive man took its first hesitant steps to unite himself in a settled village life. The instances of these first cultures have been unearthed by the archaeologists in early 1950s and 1970s from the sites of Killi Gul Muhammad in Quetta Valley and Mehrgarh in Kachi Bolan region. The Neolithic cultures of Balochistan are not merely under the consideration of South Asian Countries rather they are exemplified everywhere in the world.

Nevertheless, there are still well preserved sites with multi-dimensional cultural artifacts in Balochistan. We are sure that further archaeological explorations and excavations, if conducted in this province will not only produce valuable artefacts to cater to the needs of our new museums but will further unfold the rich legacy of Balochistan and will greatly facilitate establishment of new Museums. Development of archaeological sites and establishment of more museums in the province will boost cultural tourism while flow of more and more tourists will not only enhance the beauty of Balochistan but will also add tremendously to the socio-economic development of the province and ultimately restore peace and tranquility in the restive province.

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Research Journal of the  
Directorate of Archaeology and Museums  
Government of Khyber Pakhtunkhwa,  
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