A PARADIGM FOR
KEMETIC ARCHITECTURAL DESIGN:

THE BEGINNINGS OF A
KEMETIC ARCHITECTURAL
DESIGN LANGUAGE

by

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Master of Science in Architectural Studies

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ABSTRACT

Kemetic [Egyptian] architecture is highly recognizable. In particular, there was a distinct monumentality to its religious architecture. As well, familiar design characteristics permeated many of them. These edifices continue to be a source of discussion and debate. Opposing interpretations range in opinion; from traditional and conservative to embedded with scientific and mathematical knowledge. In this thesis, I investigate one facet of the Kemetic architectural tradition. I will first define tradition and architectural tradition. Second, I will identify the main themes. They include the Kemetic architectural continuity; the Kemetic architectural design principle; and, the determinants of the architectural design principle. The themes assist in further understanding underlying components of Kemetic architecture. To demonstrate these points, the Kemetic temple plan is used as a reference point for discussion. In the conclusion, it is my intention to bridge opposing areas of discussion to enhance them and advance the comprehension of Kemetic architecture.

Thesis Supervisor: William L. Porter
Title: Norman B. And Murial Leventhal Professor of Architecture and Planning
Asante Sana [thank you] to the Creator and Ancestors for your guidance, enlightenment and inspiration. Your perseverance, resilience, struggle and sacrifice will forever be venerated. I am your child and I owe you my existence.

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# Table of Contents

Abstract 3

Acknowledgments 5

Table of Contents 7

Table of Figures 9

Preface 11

Chapter 1  The Introduction 15
  1.0 Thesis Introduction 15
  1.1 Kemetic Architecture 16
  1.2 The Premise 20
  1.3 The Temple 21

Chapter 2  Architectural Research 23
  2.0 Introduction 23
  2.1 Kemetic Architectural Tradition 23
  2.2 The Architectural Continuity 28
  2.3 The Architectural Design Principles 38

Chapter 3  Conclusion 51
  3.0 Introduction 51
  3.1 Analysis 51
  3.2 Conclusions 52

Endnotes 55

Bibliography 59
# Table of Figures

<table>
<thead>
<tr>
<th>Figure i</th>
<th>Map of Ancient Kemet</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chapter 2</strong></td>
<td></td>
<td>23</td>
</tr>
</tbody>
</table>

| Figure 2.1 | Predynastic Burial Graves | 26 |
| Figure 2.2 | Early Dynastic Burial Tombs | 26 |
| Figure 2.3 | Mastaba Tombs | 26 |
| Figure 2.4 | Mastaba of Ptahotep at Saqqara | 27 |
| Figure 2.5 | Typical Armana Villa Plan 1364-1350 B.C.E. | 27 |
| Figure 2.6 | Land House 21st Century B.C.E. | 28 |
| Figure 2.7 | Amarna Villa | 28 |
| Figure 2.8 | View of Step Pyramid at Saqqara | 29 |
| Figure 2.9 | Step Pyramid Complex [oblique view] | 29 |
| Figure 2.10 | Pyramids of Khufu and Khafre at Ghiza | 30 |
| Figure 2.11 | Mortuary Temple of Khafre at Ghiza | 30 |
| Figure 2.12 | View of the Temple of Mentuhotep at Deir el Bahari | 30 |
| Figure 2.13 | Plan of the Temple of Mentuhotep at Deir el Bahari | 31 |
| Figure 2.14 | View of the Temples of Hatshepsut and Mentuhotep | 31 |
| Figure 2.15 | Plan of the Temple of Hatshepsut at Deir el Bahari | 31 |
| Figure 2.16 | View of the Temple of Amon at Luxor | 32 |
| Figure 2.17 | Main Constructions of the Luxor Temple | 32 |
| Figure 2.18 | Plan of the Temple of Amon at Luxor | 32 |
| Figure 2.19 | View of the Temple of Amon at Karnak | 33 |
| Figure 2.20 | Plan of the Temple of Amon at Karnak | 34 |
| Figure 2.21 | Initial Main Construction of Amon Temple at Karnak | 35 |
| Figure 2.22 | Third Main Construction of Amon Temple | 35 |
| Figure 2.23 | Sixth Main Construction of Amon Temple | 35 |
| Figure 2.24 | View of the Temple of Ramses II at Abu Simbel | 36 |
| Figure 2.25 | Plan of the Temple of Ramses II at Abu Simbel | 37 |
| Figure 2.26 | Plan of the Temple of Heru at Edfu | 37 |
| Figure 2.27 | View of Interior Front Pylon at Edfu | 38 |
| Figure 2.28 | Plan of Early Dynastic House | 39 |
| Figure 2.29 | View of Early Dynastic House | 40 |
| Figure 2.30 | Plan of the Temple of Amon at Luxor | 41 |
| Figure 2.31 | Superimposed Plan of Luxor over Ramses II | 46 |
| Figure 2.32 | Superimposed Plan of Luxor over Skeletal Frame | 47 |
| Figure 2.33 | Ceiling of Subsidiary Shrine in the Temple of Hatshepsut | 47 |
| Figure 2.34 | Clerestory of the Hypostyle Hall at Karnak | 48 |
| Figure 2.35 | Column Capitals | 49 |
| Figure 2.36 | Section of the Temple of Ramses II at Abu Simbel | 50 |
Preface

Our way, the way, is not a random path. Our way begins from coherent understanding. It is a way that aims at preserving knowledge of who we are, knowledge of the best way we have found to relate each to each, each to all, ourselves to other peoples, all to our surroundings. If our individual lives have a worthwhile aim, that aim should be a purpose inseparable from the way.

Ayi Kwei Armah

My interest in Kemet, the original name of Egypt, stemmed from my interest to learn about my history and culture. As an undergraduate student, I began to read numerous books concerning African and African-American history. I felt the need to immerse myself in the richness of my heritage. I deemed it imperative to have an understanding of where and who I came from. If I did not have knowledge of self, then I did not have a complete understanding of myself; for, I am the product of my ancestors.

While investigating my culture, I became encouraged to apply it to my chosen field of study, architecture. Around the period of my fourth year [1992], I became exposed to what was called “Afrocentric Architecture.” Afrocentricity is the belief in the centrality of Africans. It is African history, African mythology, African creative motif,
and African ethos exemplifying African's creative will. It reorganizes African's frame of reference so that we become the center of analysis and synthesis. Afrocentric Architecture is the method of manifesting architecture of African origins. It is the general foundation for the investigation of more specific areas of study concerning African and African-American architectural design, including historical and contemporary design. For the first time, I had been exposed to architecture from a perspective of African-centeredness. It opened my eyes to a new world waiting for further research and investigation. Kemet became the centerpiece of my inquiry.
Figure 13
Map of Ancient Kemet
The Introduction

1.0 Thesis Introduction

This thesis will discuss an important aspect of a long architectural tradition that existed in ancient Kemet [now known as Egypt] which spanned almost 2500 to 3000 years and conventionally divided into the Old, Middle, New and Late Kingdom periods. Generally speaking, Kemet produced a unique architecture that developed due to the nature of its culture.

This chapter will define the platform of the investigation. First, it will address the topic of Kemetic architecture. It will discuss the origins of the architecture, its general evolution to monumentality and what makes it recognizable. Second, it will identify the parameters of the investigation and outline the initial goals of the thesis. Finally, this chapter will address why the Kemetic temple will be used as the reference point for discussion.

The second chapter will discuss the
products of a Kemetic architectural tradition. First, it will define tradition and architectural tradition. Second, it will review the precedent for the temple plan. Its evolution will be considered and the variations will be distinguished. Third, it will address the architectural continuity, a product of the architecture tradition. An historical overview of the architecture will be presented to illustrate the continuity. Lastly, it will investigate the architectural design principle and its determinants. Included among the determinants is symbolism.

The final chapter will assess the outcome of the investigation.

1.1 Kemetic Architecture

The 3000 years between the Old Kingdom to the Late Period frame a time that produced ancient Kemetic architecture. Alexander Badawy suggested that the elements from early [predynastic] construction using plant stems were transferred into mud, then brick and then stone. The construction of houses from plant stems or mud evolved into an architecture of permanence and monumentality. The latter is what is generally considered when discussing Kemetic architecture. The following will describe the origins of the monumental architecture.

The Third Dynasty [2778-2723 B.C.E.]
(before the common era) saw the conception of stone architecture depicted for the first time in monumental scale. Spiro Kostof asserted that the Zoser Pyramid Complex at Saqqara [designed by the chief architect, Imhotep] was the first interpretation of the plant, timber, and brick forms of stone architecture. The superstructure of the Step Pyramid evolved from the burial graves of predynastic times and the mastabas [also built of stone] of the First and Second Dynasties [their usage continued until the end of the Middle Kingdom]. Out of the importance of burial grew the desire for protection. The use of stone provided permanent preservation of the body. The Step Pyramid Complex initiated the change of royal burial from the mastaba to a superstructure elaborate and grandiose.

The civilization of Kemet produced a recognizable architecture. By recognizable, it is meant that there was a particular character to it permeated within the physical appearance of the edifices. Although each edifice varied in scale, size, and proportion, distinguishing features marked each design that subscribed to the Kemetic architectural character. Kostof asserted that through all the changing regimes of Kemetic civilization, public architecture changed little. Although this statement over exaggerates the similarities, its underlying tone implies a Kemetic architecture that is linked by familiar
characteristics.

The monumentality of religious architecture in particular is one characteristic. Whether it be the Great Pyramids of Ghiza, the Temple of Amon at Karnak, or the Temple of Ramses II at Abu Simbel, aspects of their monumentality make them recognizable to Kemetic architecture. Each of these edifices differed in physical appearance, however, the massive pyramid of Khufu, the mammoth columns in the Hypostyle Hall of Karnak and the colossi of Ramses at the front entrance of the Abu Simbel temple provided similar qualities that made them unique to Kemet.

The ability to recognize these edifices in the period of time known as Kemetic civilization permitted a tradition to exist. This tradition stemmed from common architectural practices and patterns of the past. Included within the evolution was the necessity to accommodate change and innovation while simultaneously adhering to many historical architectural practices. This balance between innovation and tradition persisted throughout Kemetic architecture.

Scholarship

Numerous scholars have investigated Kemetic architecture by examining and categorizing it. These scholars can be divided into two groups "traditional" and "non-traditional." Within these circles, there has been an ongoing
debate concerning the interpretation of Kemetic architecture. For example, traditional scholars such as E. Baldwin Smith believed the architecture was a graphic record of instinctive conservatism. This statement implies a re-application of known forms and concepts.\(^7\) Furthermore, Badawy suggested a conscious repetition of forms lacking advanced thoughts other than to prove appreciation of earlier achievements.\(^8\) The interpretation of the architecture by Smith was itself conservative. Conversely, R.A. Schwaller de Lubicz believed that temple architecture in particular were repositories of knowledge. Embedded within them were knowledge of the "ultimate cause" or the "mysteries of Creation." He suggested that the harmony, proportion, myth and symbolism of temple's architecture expressed this knowledge.\(^9\) His interpretations differed greatly in comparison to that of Smith. However, this is but one example of the variety of translations concerning Kemetic architecture.

Interpretations are often accepted or rejected depending on the discipline of the scholar. More often than not, if the scholar is not within the discipline of the traditional circle [particularly Egyptology] then their work is not taken serious or considered scholarly. The high level of expertise by traditional scholars cannot be overlooked. But frequently, the alternative disciplines of scholars outside of traditional
Egyptology provide a different and fresh perspective. Their proficiency in other fields enables them to bring an interpretation that a traditional scholar may not have considered. Therefore, much can be learned by balancing both ends of the spectrum. It is from this premise that I will begin the discussion.

1.2 The Premise

This thesis started as an investigation of "architectural design principles" in Kemetic architecture. By architectural design principles, I mean the governing themes that informed the outcome of the architecture. These themes required many connections with Kemetic civilization. They demanded a scientific platform of knowledge. Also, they needed an understanding of the social structure of the culture. Furthermore, they compelled a desire to comprehend the religious belief system of Kemet. All of these necessities proved to exceed my level of knowledge to adequately investigate the architectural design principles. Therefore, the goal of the investigation changed.

The notion of a Kemetic architectural tradition is what this thesis will address. A tradition implies a continuity. This term means a conscious attempt to produce and reproduce architectural artifacts of similar character. Within
the architectural continuity of Kemet, there are
determinants that uphold its existence. Badawy
suggested a harmonic system of proportions that
resulted in the uniformity of the architecture.\textsuperscript{10} I
propose that architectural design principles
another product of the architectural tradition. As
stated previously, architectural design principles
are governing themes that informed the outcome
of the architecture. They served as the underlying
foundation for the architectural continuity. The
architectural continuity could not have existed
without the acceptance of themes that governed
the architecture from one generation to the next.

The investigation will take a look at
examples of architectural precedents that formed
an architectural continuity. It will also address the
topics of symbolism, light and the interrelationship
between architecture, the human body and the
universe. These themes of Kemetic architecture
will be called the determinants of the architectural
design principle. They are postulated to form the
parameters of the investigation. The temple will be
the primary reference point for this investigation.

\textbf{1.3 The Temple}

Kemetic temple architecture will be the
building type used as a model for the investigation.
It is selected because religious architecture was
built to last.\textsuperscript{11} It is the best preserved of all
Kemetic architecture. It was better preserved due to the permanence of stone and the quality of care the builders bestowed on the architecture. The monumentality of religious architecture and its embodiment of the highest social order were additional reasons for the level of care. It engendered the beliefs of the culture.

Kemetic philosophy and religion were scarcely distinguishable. There was no separation between church and state. Furthermore, there was no separation between religion and all aspects of life, including architecture. Therefore, it was believed that the temple, a religious structure, was an everlasting residence [house]. It was a royal palace in which the Ka [spirit] of the pharaoh or of the Neter could dwell. De Cenival called the temple “a machine for maintaining and developing divine energy.” The temples were planned to represent the divine connection between the pharaoh and the Neters. As the divine son or embodiment of the Neters, he built the temple as a symbol to ensure the prosperity of the nation and the permanence of the cosmic order. The transformation of it from a mere human construction into the image of the celestial horizon ensured its participation in the superhuman order and encouraged the generosity of the Neter.
Architectural Research

2.0 Introduction

This chapter will discuss the products of a Kemetic architectural tradition. First, it will define tradition and architectural tradition. Second, it will demonstrate a precedent for the Kemetic temple plan. This will show the evolution of the temple plan as an example of the role tradition participated in Kemetic architecture. Third, the Kemetic architectural continuity will be addressed. Finally, the Kemetic architectural design principles and its determinants will be discussed.

2.1 Kemetic Architectural Tradition

Tradition can be defined as a set of cultural practices handed down from one generation to the next. These cultural practices include the accommodation of change. As certain traditions are performed, better and more efficient ways of accomplishing them may develop. These changes and innovations become apart of tradition. The
renewing of these cultural practices sustain a preference for the ways of antiquity, reconfirming the tradition.

It is commonly accepted by Egyptologists that there was a tradition in Kemet. Even with the longevity of Kemetic civilization, the tradition continued through the periods of decadence and foreign rule. The unification of Upper and Lower Kemet around 3200 B.C.E. created the first nation-state. However, prior to this time, some scholars believed a pattern of culture had begun. According to Smith, several of the fundamental traditions of culture were already fixed. For instance, Asa Hilliard believed that the Medu Neter [hieroglyphic writing] existed before unification. Also, many aspects of their religion were in place in addition to astronomy, a calendrical system, myth and mathematics. A number of predynastic kingdoms existed before the unification. Essentially, there was a parent culture, probably to its south, that produced it. West believed Kemet inherited a legacy already in place. It may be implied the character of the culture was formed before the unification. It was from this character the Kemetic architectural tradition came into being.

Architectural tradition can be defined as a set of architectural practices inherited from one generation to another. These practices may include methods of construction, patterns of architectural
design, the use of particular building materials for certain cultural or religious purposes, amongst other possibilities. The adaptation of innovative methods of architecture are incorporated within the development of the architectural tradition. Each innovative method implemented helped to reform the tradition as it evolved.

Kostof called Kemetic architecture a balance between “innovation and tradition.” De Cenival asserted that the evolution of Kemetic architecture does not present itself as a continuous movement accompanied by the progressive insertion of new elements which eliminated the old ones, but as a balance choice of features all of which existed side by side. The development also included breaks from tradition. For example, there was an architectural tradition prior to Akhenaton [Amenhotep IV] of the Eighteenth Dynasty [1372-1354 B.C.E.]. The re-orientation of the traditional religion from the Neter Amon to Aten created a change in architecture. However, the architectural tradition must have had an effect on Akhenaton’s. Equally, his architecture had an effect on succeeding pharaohs attempting to redirect the architectural traditions of the past. Each part of this episode contributed to the evolution of the Kemetic architectural tradition. The following section will use the temple plan as an example for the development of an architectural tradition.
The Evolution of the Temple Plan

This section will illustrate the relationship between the house and the temple. The relationship will describe the evolution of the temple floor plan and its essential spatial elements. These spatial elements are the forecourt, the hypostyle hall and the inner sanctuary. This section will also give two possibilities why this evolution may have occurred.

Smith believed that temples gradually transformed from houses of the living to religious use. The burial of the deceased in the floors of houses suggests one reason why the model of the house came into religious use. It was a primary prototype of the grave superstructure. For example, the rectangular brick superstructures at Negadeh were thought of as houses. The brick exteriors reproduced a house form with a forecourt and two doors. During the Old and Middle Kingdom, they became the standard type of tomb called mastabas.

In Lower Kemet at Tarkhan, a First Dynasty cemetery had tombs that were like mud-brick houses with the deceased buried in shallow holes with sand filling the rest of the house to make a mastaba tomb. According to Smith, each tomb had a small courtyard, like an entrance vestibule or chapel, before which the offerings were made as if at the door of a house. These tombs had the essential elements of the mastaba.
The basic parts of the temple were the traditional and essential house elements. This was another reason for the relationship between the house and the temple. They consisted of the temple forecourt and courtyard [entrance vestibule for reception and portico], the hypostyle hall [columned hall as living area] and the inner sanctuary [apartments or bedrooms as private quarters]. The fundamental house spatial elements [located in the brackets] were what was needed
for the concept of the temple to evolve.

It must also be mentioned that the house was a mark of power and the dwelling of the ruling family possessed special social and religious distinction. Therefore, it was important that the temple [a religious and royal palace] carry the traditional design elements of the house. This idea implies the meaningful role of the architectural tradition. Also, the desire to renew established spatial elements suggests the possibility of an architectural continuity.

2.2 The Architectural Continuity

This section will address the idea of a Kemetic architectural continuity. A historical overview of temple architecture will illustrate the renewal of hierarchical spatial elements. The purpose is to display the adherence to the spatial hierarchy of secular to sacred space despite the variations of the design solutions; particularly due to site constraints and other determining factors.

Generally speaking, Kemetic architecture is believed to have lacked individual self-expression. What was built was for the benefit of the state, therefore, for the benefit of the people. There did not exist an art for the sake of art. It served a higher purpose and that purpose rarely diverged from the ways of tradition; particularly in temple architecture. Aesthetic concerns were
secondary to symbolic [primarily religious] ones. The temple was especially indicative of the society’s intimate relationship with religion. Eventually, the adherence to tradition may have led to similar design elements and themes reappearing in edifices; ultimately, reflecting in harmonious ties in architecture over successive dynasties.

Step Pyramid Complex at Saqqara

The Step Pyramid Complex was built during the Third Dynasty [2778-2723 B.C.E.] of the Old Kingdom for the pharaoh Zoser by the architect Imhotep. The entrance into the complex penetrated through a wall [33 feet] which enclosed the complex. The enclosed area was a rectangular space 607 by 304 yards. The entrance led to either a northern hallway which connected to Heb-Sed Court or the eastern Hall of Colonnade that had a series of wall supports and connected to the Great Court. The Heb-Sed Court joined to its east the Temple of Ausar [Osiris to the Greeks]. The Great Court had adjacent to its northwest corner a space that led past the Step Pyramid and connected to the Court of the Southern Palace, the Serdab and the Court of the Northern Palace. To its east, the Serdab linked the Mortuary Temple [located on the northern side of the Step Pyramid]. The northern most point of the enclosed site contained the Great Altar.
The Pyramid Complex of Khafre at Ghiza

The Pyramids of Ghiza were also built during the Old Kingdom, but during the Fourth Dynasty [2723-2563 B.C.E.]. In particular, the Pyramid of Khafre [Chephren] furnished a well preserved indication of the tomb chapel. Its entrance was the enclosed corridor of the causeway leading down to the valley. A chamber for the guardian was to the right of the entrance and a vestibule with magazines leading off from it were to the left. The vestibule had a short passage which gave access to a T-shaped reception hall. An opened court surrounded by rectangular piers followed the hall. To the west of the court were five parallel sanctuaries where the pharaoh was worshipped under his five official titles. The public was not allowed beyond these chapels and only the priests could penetrate to the inner storerooms and the holy of holies.39

The Mortuary Temple of Mentuhotep

The mortuary temple of Mentuhotep of the Eleventh Dynasty [2131-2000 B.C.E.] at Deir el Bahari was constructed during the Middle Kingdom. The ground plan is on three levels. The lowest level had a colonnade and was intersected by a sloping ramp. The ramp led to the next level which housed the temple. On the roof of this level sat a pyramid. To the northwest side were six small chapels. Adjoining the temple was a smaller
pillared hall, with a shaft that led to a burial chamber. The last room contained the holy of holies. It was hewn out of the rock of the cliff. A second burial chamber was built into the pyramid itself.

**The Mortuary Temple of Hatshepsut**

The mortuary temple of Queen Hatshepsut of the Eighteenth Dynasty [1503-1482 B.C.E.] was erected during the New Kingdom [1580-1314 B.C.E.]. The landscape, terrace architecture gave it a general resemblance of Mentuhotep's. Each sat side by side at the foot of a cliff.

The entrance courtyard led to an inclined ramp and to the first terrace. This terrace terminated with the facade of a colonnade that supported the second terrace. A second ramp led to it. The colonnade to the left of the ramp was dedicated to the expedition to Punt [present day Somalia, the mythical homeland of the Neters]. The colonnade to the right was dedicated to the divine birth of Hatshepsut. The hewn cut Chapel of Anubis adjoined the Hall of Birth. The sanctuary of Hathor adjoined the colonnade dedicated to the Punt expedition. The upper terrace had a Hypostyle Hall that served as a vestibule. Behind the Hypostyle Hall was another large court, northwest of it was the altar and Hall
The Temple of Amon at Luxor

The Temple of Amon at Luxor [originally called Shemayit-Ipet, the Southern Place] dates probably to the beginning of the Eighteenth Dynasty [1580-1314 B.C.E.], when the Twelfth Dynasty [2000-1785 B.C.E.] shrine had fallen to ruins. Its importance lie in the repeated additions [accretion] and alterations to the original structure by succeeding generations of pharaohs. It was originally built by Amenhotep III [1412-1376 B.C.E.], New Kingdom.

The entire construction can be broken down into two main phases. The first phase of the temple construction included the covered temple or inner sanctuary and the great hypostyle hall. The second phase added the outer forecourt for the public [called the court of Ramses II]. An entrance pylon gave access to the final addition.

The temple had a large forecourt [148 feet wide and 184 feet long] surrounded by three sides by two rows of bundled, papyrus-bud columns. It was preceded by a traditional pylon. Beyond the court came the Hypostyle Hall followed by smaller halls and the sanctuary of Amon [holy of holies] with the chapels of Mut and Khonsu at the sides. Before his death, Amenhotep started construction...
of a double [processional] colonnade of gigantic columns with spreading, campaniform papyrus capitals that led up to the entrance pylon. Upon completion, there were fourteen columns, each fifty-two feet high. On axis with the inner sanctuary some distance to the north of the temple, stood a small shrine in granite built several decades earlier by Tuthmoses III [1504-1450 B.C.E.].

A century and a half after the completion of Amenhotep’s temple, Ramses II [1301-1235 B.C.E.] added a northern court [forecourt] to it, with porticoes on all four sides. In front of its massive pylon he set up colossi of himself, four standing and two sitting. Two tekhenw [obelisks] flanking the main entrance were added as well. This court was shaped in a parallelogram, it is believed, to account for the bent axis of the temple. It incorporated the Tuthmoses III shrine on the inner face of the pylon.

The Temple of Amon at Karnak

The Temple of Amon at Karnak was originally known as Ipet-Isut, “the most select of places” or “the most holy of places.”50 It was both a center for religion and education. Karnak was the largest complex of temples in Kemet and the largest in the world with twenty temples, shrines and sacred halls. The sacred enclosure covered 61,775 acres. The temple consecrated to Amon
Figure 2.20*49
Plan of the Temple of Amon at Karnak illustrating spatial organization: forecourt, Hypostyle Hall, middle halls, old shrine [inner sanctuary], and the Festival Hall at the rear

was the largest. It was constructed by the accretion method. After final extensions were made, it was 1220 feet long and 338 feet wide. This was space enough to accommodate the cathedrals of St. Peter's, Milan and Notre Dame of Paris.51

As stated before, this process consisted of additions and alterations by succeeding pharaohs. In the case of the Temple of Amon, it was generally to the front of larger courtyards and pylons. It was consistently enlarged, embellished and maintained from 2000 B.C.E. until the birth of Christ. Although it was repeatedly altered, the axis was never changed.

It was believed that some work was by Amenhotep I [1557-1530 B.C.E.], but it wasn't until Tuthmoses I [1530-1520 B.C.E.], New Kingdom, made Waset [Thebes] the capital of Kemet that the old shrine was incorporated into the building of the new temple. The old shrine [inner sanctuary or holy of holies] was dedicated to Amon on the site during the Twelfth Dynasty [2000-1785 B.C.E.] of the Middle Kingdom. It was incorporated into what are now the ruins of the east end.

There were nine major constructions to the Temple of Amon, including the major initial construction begun by Tuthmoses I. His architect, Ineny, built a colonnaded court with Ausarid statues around the Middle Kingdom temple
preceded by two pylons to the west. Between the pylons, he constructed a hall of columns built of cedar. These were enclosed by a perimeter wall.

Hatshepsut [1520-1484 B.C.E.] started the process of accretion by unroofing the central part of the hall with cedar columns and erecting two tekhenw [obelisks] in the space. Tuthmoses III [1504-1450 B.C.E.] encased the tekhenw up to eight feet and remade the hall leaving the top of them projecting above the roof. He also made two Halls of Annals between the pylons of Tuthmoses I. Twenty years later, he extended the temple eastward by building a Festival Hall, the Heb-Sed jubilee complex. Behind this hall, a small temple dedicated to Amon-Re-Herakhty was built. Amenhotep III [1408-1372 B.C.E.] added a forecourt to the west, erected an entrance pylon and built an avenue of ram-sphinxes.

Ramses I [1314-1312 B.C.E.] later erected a pylon and probably started the great Hypostyle Hall in between his pylon and that of Amenhotep III. Sety I [1312-1298 B.C.E.] completed the Hypostyle Hall. It contained 136 columns which stood in sixteen rows. The central aisle of the temple contained twelve columns [in two rows] which were sixty-nine feet in height; the capitals were in the shape of open papyrus umbrels. The central aisle columns paralleled to each of the remaining rows, which were forty-two feet in height and whose capitals were closed papyrus
buds. The difference in height was filled by a stone grille or clerestory. This great hall measured 338 feet in width and 170 feet in length.

One hundred years later, Ramses III [1198-1166 B.C.E.] built a temple partly in front of the existing entrance pylon of Ramses I. The Libyan pharaohs of the Twenty-Second Dynasty [950-730 B.C.E.] built the final forecourt, called the court of Bubastides, which was laid out to be larger than any other part of the temple. The construction of the forecourt was completed by Taharqa [698-663 B.C.E.], the Ethiopian pharaoh of the Twenty-Fifth Dynasty. He built the last and largest pylon which remained the main entrance to the facade. The pylon was 370 feet wide, 49 feet thick, and 142.5 feet high; a total of 54,000 square feet. The forecourt was 93,000 square feet; 276 feet long and 338 feet wide.

There were other constructions at this site, including alterations by Ramses II [1301-1235 B.C.E.], Ramses IV [1160-1155 B.C.E.] and during the Ptolemaic period [323-30 B.C.E.]. Considering the old shrine dates back to the Middle Kingdom, the complex was a history of some 2000 years of Kemetic architecture.\(^{57}\)

**The Temple of Ramses II at Abu Simbel**

The Temple of Ramses II [1301-1235 B.C.E.] at Abu Simbel in Upper Kemet was constructed during the Twenty-Fifth Dynasty, New Kingdom. The temple was almost entirely
hallowed out of a cliff. The facade pylon was
carved into the rock cliff and was preceded by
four colossal figures of a seated Ramses II. Upon
entering the temple, the first hall was said to
represent the traditional forecourt of the typical
mortuary temple. At the west end were three
doors. The side ones led into lateral chambers and
the central one opened into the main hall. Beyond
the hall was an antechamber preceding the inner
sanctuary [holy of holies] in which four Neters,
Ramses, Ptah, Amon, and Harakhty were seated in
hierarchic dignity.

The Temple of Heru at Edfu

The Temple of Heru [Horus to the Greeks]
at Edfu was erected during the Late Period. This
was the period when Greece conquered and
occupied Kemet. The construction began in 237
B.C.E. under Ptolemy III Euergetes I and the final
decorations were finished in 57 B.C.E. Although
Kemet was occupied by alien conquerors,
traditional elements were adhered to. The temple
plan illustrated these elements.

The pylon introduced the main entrance to
the temple. A pillared court followed the entrance.
A large vestibule opened on to a wider and higher
than the rest of the temple [excluding the entry
pylon]. A suite of three [hypostyle] halls in
enfilade was flanked by secondary chambers
including a treasury and staircase. The central
sanctuary [holy of holies] housed the Neter of
Heru in a stone shrine.

Conclusion

The examples in this section illustrate the renewal of traditional spatial elements. It displays the adherence to the spatial hierarchy in spite of the numerous alternatives of each design solutions. Underlying themes may have governed the devotion to spatial hierarchy specifically and architecture in general. The following section will address architectural design principles and its determinants as a technique to regulate architectural design.

2.3 The Architectural Design Principle

This section will define the architectural design principle and an example of its utilization will be reviewed. Several of its determinants will be defined and investigated to illustrate how they effected the architecture. The purpose is to show how the architectural principle and its determinants was used as a mechanism for manipulating the architecture for the desired effects of the builders.

As stated in Chapter 1, the architectural design principle is defined as governing design themes that informed the outcome of the
architecture. These design themes were constructed from architectural precedents and established over the course of centuries. They may have evolved due to the regularity of implementing them. They were intentionally employed and became a fundamental part of the architectural artifact. Identifying them assists in further comprehending the architecture of Kemet.

The fundamental spatial elements that evolved from the temple plan were the forecourt, the hypostyle hall and the inner sanctuary. Each of these were distinguished by a spatial hierarchy attached to them. The spaces progressed from secular to sacred in their arrangement. This was an architectural design principle that continued throughout Kemet. In section 2.1, the house plan was discussed as the architectural prototype for the temple plan. This section will revisit the house plan in order to clarify its spatial hierarchical relationship with the temple plan. Also, symbolism will be defined and addressed.

**Precedent for the Temple Plan**

Generally speaking, the house plan contained the entrance vestibule, the columned hall as the living area, and the bedrooms or apartments as private quarters. Looking at these spaces affords the opportunity to witness the gradual privatization of spaces through planned hierarchical considerations. The spatial arrangement began with the welcoming of guests...
Figure 2.29
Restored view of a soul house showing an open vestibule court in front of private spaces of house

in the entry vestibule. This was the most public of areas. That space was followed by the living area. It may be considered semi-public space due to selected guests being invited to this area or the family partaking in activities there. Guest do not enter this space without first being greeted or recognized as welcomed in the entrance vestibule.

The bedrooms or apartments were the most private spaces in the house. These were the sleeping quarters of the inhabitants. Because they were located in the rear of the previously mentioned spaces, they were ensured a sense of privacy through the filtering out of persons deemed unwelcome.

The temple plan had an arrangement of spaces that paralleled the house. As a religious structure, the temple space progressed from secular to sacred space. The most public and secular space was the forecourt. It was open to public congregations. In addition, this was generally the main entrance for the temple. Therefore, it was a gathering space for people from all social classes; including the priests and the public.

The hypostyle hall was the middle hall that served only the priests and noble men. This was akin to the columned hall or living area of the house plan. It also acted as a vehicle for the separation of people and an intermediate point
between the secular and sacred spaces. In this case, it is possible that social classes were separated at this point. The more privileged or educated in religious doctrine were allowed to progress to more sacred spaces.

The inner sanctuary or holy of holies was the most private of spaces in the temple. Its function dictated that it only be entered by the high priests and pharaoh. Normally, the inner sanctuary contained the statue of the Neter to whom the temple was consecrated to. This was where the Neter came to dwell and where he or she was worshipped. The inner sanctuary was the most venerated space and could not be entered by the profane. Because of its function, it was the most sacred of spaces in the temple, therefore, the most private. Its hierarchical arrangement ensured limited access and circulation.

**Symbolism**

Symbolism may be defined as a deliberate means of evoking understanding without interpretation. As a method, it may be utilized as one image to convey the meaning of another. Some scholars believe that Kemetic culture symbolism as a vehicle for conveying ideas and beliefs, similar to a language. The culture was holistic, therefore, symbolism permeated many aspects of society. Architecture, religion, science, medicine, clothing, jewelry, philosophy, writing and many other facets of everyday living were
suggested to have been influenced by varying forms of symbolic expression. It was believed that symbolism impregnated the entire temple, giving shape to it and clarifying its details. It is possible to view the temple as a symbolic expression.

The Determinants

The determinants of the architectural design principle are design attributes that additionally influenced the architectural product. By implementing the determinants, the effects of the architectural design principle were aided. They reinforced the desired outcome of the architecture. Three determinants will be addressed in this section. Each served as symbolic gestures to reconfirm the architectural design principle. They include the following: the temple as educational centers; the temple as a microcosm for the human body and the universe; and the manipulation of light.

The Temple as an Educational Center

As educational centers, each act of instruction took place at a predetermined point in the temple. The various parts of the temple were separated in order to teach different levels of knowledge. Each level awakened a higher level of consciousness. The arrangement and interconnection of the sanctuaries were fixed in accordance with theology. It distinguished the relationship of the Neter worshipped in one of the
chapels with the others. The situation of the room helped to express the place of the Neter in the world of the theology.65

Specifically addressing the temple as an education center, the forecourt or courtyard was utilized as workshops for craftsmen to service of the temple. It was believed that this part of the temple contained stores, schools for the training of specialists, and other workmen.66 It was here where more practical knowledge was shared such as crafts and trades.

The initiate of the educational system could reach the “Outer Temple” or “Peristyle” where utilitarian and exoteric knowledge was mastered by scribes and priests to cultivate their minds. These lessons were fundamental in reaching the Inner Temple. Once admitted to the Inner Temple, the initiate learned about symbols and came to know him or herself by having revealed to them esoteric knowledge.67 It was forbidden that anyone else enter this space other than the high priests and pharaoh.

**The Temple as a Microcosm**

Many scholars have written on Kemetic culture’s fixation with studying the natural environment around them. The study of the environment beyond the earth [celestial bodies] and the observation of the environment on the earth were included. They observed movement, change and life itself. In the Nile Valley, they
witnessed nature's regular process of birth, growth, aging, death, decay, and rebirth. This was paramount in annual flooding of the Nile River. Repeated observations of the river's inundation led to the ability to predict the flooding seasons and the dry seasons. They witnessed a cyclical behavior of nature.68

“A grand design appeared evident throughout the universe, enabling one who studied any part of the universe to understand the rest of it through the play of analogies.”69 Their observations and use of analogies allowed the Kemetic people to view the universe and nature as the macrocosm and the human body as the microcosm. Architecture was included in the philosophical play of analogies. For instance, the body was the residence of the eternal self; the house was the residence of the physical self; and the temple was the residence of the spiritual self. The body and the temple were each referred to as the house of God.70 Each cultivated an aspect of human development. This shows the character of the culture's use of analogies. In particular, the human body and the temple were considered to be a microcosm of the universe. The interpretation of two scholars will briefly address these ideas.

The premise of R.A. Schwaller de Lubicz's work was the Kemet philosophy that “man is the summation of the universe.”71 According to him, in ancient Kemet, art, science, philosophy and
religion were all aspects or facets of a complete understanding and were employed simultaneously: there was no Kemetic art without science, no philosophy that was not religious. No aspect of their knowledge was divorced from another. Central to this complete understanding was the knowledge that man presented the created image of all creation. Therefore, Kemetic symbolism and all measures were scaled to man, to earth, and ultimately to the solar system. 72 "The temple, therefore, can only be in the image of the universe, of heaven, the symbol of heaven and all its influences; this image must necessarily borrow its elements from the human body, from its organs and from the functions of its organism." 73 These statements assert the belief of the interrelationships between the universe, the human body and the temple. All these interlinked themes had mathematical and scientific knowledge, allegedly the underpinning laws of nature; specifically, the natural environment and the human body.

Schwaller de Lubicz contended that if Kemet possessed knowledge of this magnitude, then it would be incorporated in their temples. This would not be an explicit transmission of information in text, but in the harmony, proportion, myth and symbol. 76 In particular, he asserted that the Temple of Amon at Luxor was a library of knowledge pertaining to the universe.
He believed that this knowledge was embodied implicitly within the temple itself. "The entire temple becomes a book explaining the secret functions of the organs and nerve centers [of the human body]."

The floor plan of the Temple of Amon at Luxor was viewed as an abstract representation of the anatomical structure of man. In his investigation of the temple, Schwaller de Lubicz superimposed a colossal statue of Ramses II over the floor plan. This gesture allowed him to conclude many similarities between the human body and the temple.

The head of the body was located exactly in the sanctuaries of the covered temple; the pineal gland [what was known as the Third Eye or the Eye of Heru] was located at the holy of holies; the sanctuary of the barque of Amon was in the oral cavity; the clavicles were marked by walls; the chest was located in the first hypostyle of the covered temple and ends with the temple’s platform. The abdomen was represented by the peristyle court, and the pubis was located at the door separating this peristyle from the colonnade of Amon. The colonnade was dedicated to the femurs, the thighs; the knees were at the site of the gate in front of which sat two colossi, marking this colonnade. The tibias were in the court of Ramses, framed by the colossi, whose legs (tibias) were exactly at the northwest angle of the pylon.
In addition to the temple plan symbolizing the human body, it was suggested that each segment of the temple had illustrations adorned on the walls that related to specific human body functions. In the hall that corresponded to the center of perception, there were designs that emphasized time, space, measurement and orientation. This hall also contained twelve columns which were believed to correspond to the twelve hours of day. In the hall that corresponded to the mouth, there was written all the names of the Neters and the creation of the God by Ptah through the spoken word. At the site of the vocal cords, under the chin, the pharaoh was baptized and given his new name. It was believed that this hall was where the scene of the marriage of the mother of the pharaoh and the Neter Amon was located. At the site of the thyroid gland, which controls growth, there were scenes of childbirth and nursing. At the site of the umbilical cord, an inscription on the architrave between two columns announced that here takes place the birth, growth and coronation of the pharaoh.

Richard Wilkinson suggested that the temple, especially in the New Kingdom, was a symbolic model of the universe. The builders literally adorned the temple roof as a symbolic representation of the sky by painting stars and birds upon it. The birds were to represent protective Neters. He went on further by saying
the temple floor corresponded to the great marsh from which the primeval world arose according to theology. The great columns of the pillared courts and halls were made to represent palms, lotus or papyrus plants, with their intricately worked capitals depicting the leaves or flowers of these plants. The lower sections of the temple walls were also often decorated with representations of marsh plants. The whole effect was considerably heightened in a number of temples where the outer courts and pillared halls were actually flooded in the annual inundation of the Nile.

Wilkinson went on further to say that the wall which surrounded the temple complex was sometimes built on an alternating concave and convex foundation bed to represent the waves of the watery environment of the primeval beginning of the universe according to their religious doctrine. The raised inner sanctuary was said to symbolize the primeval earth mound from the waters at the world’s beginning, and the first appearance of the Netters themselves.
The Manipulation of Light

The effects of lighting in the temple strengthened the hierarchy of secular to sacred space. In particular, during the New Kingdom and Late Periods, the predominant way of achieving the manipulation of light was the rising of the floor and lowering of the ceiling according to the spatial layout. The light within the temple decreased toward the rear in successive halls in proportion to the rising floor level and the lowering of the ceiling level. Also, the placement of columns, as well as their height and size, contributed to the manipulation of light and the shading it created in this controlled atmosphere. Sometime during the New Kingdom, stone grilled clerestories were created by the difference in height between the columns rows. This enabled the control of additional lighting in the middle halls.

Like the house vestibule, the temple forecourt or outer court did not have a ceiling over its entire floor area. Therefore, the orientation of light was not strictly observed. In the following halls, along the center axis, the orientation of light towards the sanctuary was more emphasized. Often in these temples, the arrangement of the columns created a clerestory down the center aisles of the middle halls. The side aisles remained in shadows and the thickness of the column shafts helped them to remain that way. The narrowing of passages along the axis
contributed to the orientation of light towards the sanctuary, drawing the visitor deeper into the temple. The inner sanctuary was often in total darkness, adding to the mystery of this space. The Temple of Heru at Edfu illustrates this effect.

Figure 3.36
Section of the Temple of Heru at Edfu illustrating the lowering of the ceiling level and the raising of the floor level.
3

Conclusion

3.0 Introduction

This chapter will assess the outcome of the investigation and draw final conclusions. First, it will review the goals of the thesis; specifically, the investigation of the products of a Kemetic architectural tradition. The products are the architectural continuity, the architectural design principles, and the determinants of the architectural design principle. Second, it will analyze the investigation of the products and the architectural tradition. Third, it will draw conclusions from the investigation while relating them to the goal of the thesis.

3.1 Analysis

Both tradition and architectural tradition were defined. An example was given to address the development of an architectural tradition. In particular, this example illustrated how an architectural tradition evolved. During its
evolution, the architectural tradition was repeatedly incorporated into the architecture. This included variations of the design element according to the individual design solution. It was determined that a ramification of renewing design elements was an architectural continuity.

The architectural continuity was demonstrated by analyzing Kemetic architecture from various time periods. Temple architecture was chosen as the building type for this historical overview. From this review, the adherence to spatial hierarchy was followed. More specifically, secular to sacred space existed in all of the examples, although there were a range of differences in the general design solutions. I suggest that an underlying guideline dictated the architectural continuity.

The architectural design principle was investigated as a product of the Kemetic architectural tradition. Further investigation revealed determinants of the architectural design principle. Three determinants were reviewed as examples.

3.2 Conclusions

A Kemetic architectural tradition was revealed. Investigating the evolution of the temple plan was the example used to confirm this idea. From the predynastic house to the New Kingdom
temple, the origins and development of the plan were reviewed. The illustrations and descriptions permitted an architectural tradition to be considered. Examining the temple plan development stimulated the thought of an architectural continuity. If there was a conscious effort to adhere to an architectural tradition, then similar architectural characteristics may have evolved.

A Kemetic architectural continuity was substantiated. This was done by presenting an architectural overview. Throughout Kemetic architecture, there were familiar characteristics of design. The temple plan was used as an example to investigate similarities in the edifices. A spatial hierarchy was seen in temple after temple. Each temple had varying design solutions due to a number of reasons; particularly design constraints. However, there continued to be an adherence to spatial hierarchy. Each temple depicted the renewal of secular to sacred space. There was a general devotion to this particular design element. It may have influenced design decisions in order to produce and reproduce preconceived outcomes.

Overall, this investigation revisited the idea of a Kemetic architectural tradition. The products of the architectural tradition could not have existed without it as a foundation. Each product was linked by architectural tradition. From these conclusions, architectural precedents were heavily
relied on. They served as models for subsequent designs. The variety of the design solutions and adherence to traditional design themes illustrates what Kostof called a balance of innovation and tradition.
Endnotes


2 David Hughes, *Afrocentric Architecture: a design primer* (Columbus, OH, 1994), p. 6


5 Kostof, *A History of Architecture*, p. 71

6 Kostof, *A History of Architecture*, p. 89

7 E. Baldwin Smith, *Egyptian Architecture as a Cultural Expression* (New York, 1938), p. 11


12 De Cenival, *Living Architecture*, p. 15


14 De Cenival, *Living Architecture*, p. 7

15 De Cenival, *Living Architecture*, p. 16

16 De Cenival, *Living Architecture*, p. 86


18 Smith, *Egyptian Architecture*, p. 3


20 Chandler, *Egypt Revisited*, p. 120

21 Hilliard, *The Maroon Within Us*, p. 87

22 West, *Serpent in the Sky*, p. x

24 De Cenival, *Living Architecture*, p. 184
25 Smith, *Egyptian Architecture*, p. 50
26 Smith, *Egyptian Architecture*, p. 50
27 Smith, *Egyptian Architecture*, p. 12
28 Smith, *Egyptian Architecture*, pp. 51-52
29 Smith, *Egyptian Architecture*, p. 86
30 Smith, *Egyptian Architecture*, p. 52
31 Smith, *Egyptian Architecture*, p. 88
32 Badawy, *Architecture in Ancient Egypt*, p. 22
33 Badawy, *Architecture in Ancient Egypt*, p. 22
34 Badawy, *Architecture in Ancient Egypt*, p. 22
35 Badawy, *Architecture in Ancient Egypt*, p. 22
36 Smith, *Egyptian Architecture*, p. 60
37 Kostof, *History of Architecture*, p. 72
38 Smith, *Egyptian Architecture*, p. 94
39 Smith, *Egyptian Architecture*, p. 123
40 Smith, *Egyptian Architecture*, p. 100
41 Smith, *Egyptian Architecture*, p. 100
42 Smith, *Egyptian Architecture*, p. 128
43 Smith, *Egyptian Architecture*, p. 129
44 Smith, *Egyptian Architecture*, p. 183
46 Schwaller de Lubicz, *The Temple in Man*, p. 22
47 Margaret A. Murray, *Egyptian Temples* (New York, 1931), p. 69
48 Smith, *Egyptian Architecture*, p. 160
49 Smith, *Egyptian Architecture*, p. 160
50 Hilliard, *The Maroon Within Us*, p. 122
51 Smith, *Egyptian Architecture*, p. 161

52 Kostof, *A History of Architecture*, p. 84

53 Kostof, *A History of Architecture*, p. 84

54 Kostof, *A History of Architecture*, p. 84

55 Michalowski Kazimierz, *Art of Ancient Egypt* (New York, 1969); p. 554

56 Kazimierz, *Art of Ancient Egypt*, p. 554

57 Smith, *Egyptian Architecture*, p. 159

58 Smith, *Egyptian Architecture*, p. 180

59 Smith, *Egyptian Architecture*, p. 183

60 Smith, *Egyptian Architecture*, p. 201

61 Smith, *Egyptian Architecture*, p. 201

62 Schwaller de Lubicz, *The Temple in Man*, p. 22

63 West, *Serpent in the Sky*, p. 129

64 Browder, *Nile Valley Contributions*, p. 82

65 De Cenival, *Living Architecture*, p. 96


68 Hilliard, *The Maroon Within Us*, p. 91

69 Hilliard, *The Maroon Within Us*, p. 91

70 Schwaller de Lubicz, *Her-Bak*; p. 189


72 West, *Serpent in the Sky*, p. 69

73 R.A. Schwaller de Lubicz, *The Egyptian Miracle: An Introduction to the Wisdom of the Temple* (Rochester, VT, 1985), p. 27

74 Browder, *Nile Valley Contributions*, p. 120

75 Schwaller de Lubicz, *The Temple in Man*, p. 23

76 West, *Serpent in the Sky*, p. 22
West, Serpent in the Sky, p. 158

Schwaller de Lubicz, The Temple in Man, p. 24

Browder, Nile Valley Contributions, p. 120

Browder, Nile Valley Contributions, p. 120

West, Serpent in the Sky, pp. 160-161

De Cenival, Living Architecture, p.82

Michalowski, Art of Ancient Egypt, p. 579

Richard H. Wilkinson, Symbol and Magic in Egyptian Art, p. 27

Wilkinson, Symbol and Magic ; p. 27

Wilkinson, Symbol and Magic , p. 27

Wilkinson, Symbol and Magic ; p. 28

De Cenival, Living Architecture, p.140

Seton Lloyd, Hans Wolfgang Muller, Roland Martin, Ancient Architecture: Mesopotamia, Egypt, Crete, Greece (New York, 1974), p. 132

De Cenival, Living Architecture, p. 148
Bibliography


