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The history of monasteries in Egypt as self-sustained settlements

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Abstract. Monasticism initiated in Egypt and has spread worldwide. It introduced a new self-sustained architectural innovation called "monasteries". Monasteries can be considered as homogeneous self-sustained settlements through history. This paper aims to document the origins of monasticism, leading to the development of self-sustained monasteries: conceptually, economically, and architecturally. It relies on observations, maps, and historical references. The main challenges in collecting data for this paper were the lack of published references about origins of monasticism. Most of the resources are rare documents stored in the Coptic Clerical and Theological College of Cairo, and libraries of monasteries. Thus, the paper analysis present monasteries as self-sufficient, self-sustained settlements that survived through history since the fourth century to the current state through: (zoning, architectural elements, building materials, and buildingtechniques. The architectural analysis shows that the architectural solutions of monasteriesevolved in respect to the geographical location, and context. Monasteries architecture relies on trials and errors, until it reached an applicable architectural model. Keywords: History of Monasteries, Monasteries architecture, Monasteries zoning, self-sustained settlements.

1. Introduction

 "Coptic monasticism started as the embodiment of the ascetic philosophical intellectual theory of celibacy and devotion in the wilderness" [1]. In other words; monasticism relies on loneliness and optional poverty. This term was first introduced in the second half of the third century as Eremiticálmode (solitude) of life, then evolved to Cenobitic(communal) life [2]. Monk is a Greek word derived from "Monos", which means solitary or loneliness. On the other hand, in Arabic, it is called "Râheb", which means fear of God [3]. This paper will document monasteries built by the main two monastic systems through history; founded by Father Anthony (semi-Cenobitic) and Father Pachomius (total-Cenobitic). Both models have architectural existing references, that led to the establishment of these self-sustained settlements. The chronological evolution of monasteries will be covered conceptually, architecturally, and sustainably, influenced by evolution and traces of monasticism since the fourth century. This study will cover two monasteries dating to the fourth century (Saint Simon, and Abu Makâr Monasteries), reflecting how these systems of Cenobitic life affect architecture.

This paper will introduce monasticism and its main pillars to explain architectural development of monasteries. The analysis includes historical architectural elements, and clarifies the two monastic systems of the fourth century. Furthermore, the paper will explain the main architectural elements in monasteries design in the current state, in respect to zoning. The methodology of this paper lies in understanding Coptic monasticism idea and translating the historical text into diagrams. This paper will be constructed vertically, starting with the origins of Coptic monasticism, the main two monastic models (Eremitic and Cenobitic), then the geographical location of these models, and their differences especially in the cell design, using saint Simon and Abu Makar Monasteries as an example of each monastic system.

2. **The origins of Coptic monasticism in Egypt**

The basis of monasticism was the life of Jesus; taking Him as the role model. Also, following many figures like Paul the Tarsus, who was a great inspiration for monasticism [1]. In contrast to the claims that monasticism was inspired by different cultures; like Indians, ancient Egyptians, Jewish, and Greeks, all monastic rituals were extracted from the Bible [1, 4]. Coptic monasticism stands on three pillars which are solitary life in the desert, optional poverty, and obedience [1]. "They tried to reach a state of a pure heart. Through ascetic control over their passions, Monks were meant to reach a purity of soul, in which state they could gain so-called spiritual knowledge" [5].

Egypt's rich history and special geographical location helped in initiating Monasteries. Egypt's desert had a great impact on religious life since the ancient Egyptians. In the hard life of the desert, they found a spiritual connection to their gods. Furthermore, it was documented in "Oxyrhynchus papyri" the third century, that was discovered in the late nineteenth century, that religion has dominated the culture in almost every aspect of their daily life, and in their building of tombs and temples [6]. Many historians claimed that after the end of the era of martyrdom for Christians, by the Romans at the beginning of the fourth century, living in the desert with all its suffering, a kind of martyrdom without bloodshed [7].

2.1. *Monastic models*

There were two main attempts to Coptic monasticism, named after each Father established it, and reflect the idea of monasticism.

The first attempt for monasticism was established in the age of the emperor Antoninus Pius by a wealthy man called Frontonius in the mid of the second century (138-161 A.D). Frontonius stayed with seventy men in Nitra desert in Egypt, although this attempt failed to complete due to the lack of supplies[8] .Coptic monasticism could be divided into two main models, Eremitical mode of life, known as the solitary hermit life, and Cenobitic mode of life, known as the communal life [1,3].

Saint Paul of Thebes, the first hermit, started the Eremitical mode of life in the middle of the third century. He settled nearby a well and a palm tree in a cave, in the Egyptian desert near the red sea. He settled there when he was fifteen years old, and it was said that he spent almost ninety years in the desert without seeing any human, until he was found by Father Anthony and passed away around (ca. 340/341) [9]. Eremitical mode was known as hermit model, in which each hermit stayed in total loneliness, in a cave beside a source of water. This life was very hard to maintain due to lack of food, and wild animals attacks; therefore, Cenobitic mode appeared to endure the hard life of solitary hermits [10].

There were two parallel movements in the fourth century towards Cenobitic mode. The first movement was semi-Cenobitic by Father Anthony who formed small hermitage communities in Egypt by the red sea (ca. 313). Having some rules, the monks split the desert into small monasteries, known as "Manshoubia". Each monastery is ruled by the eldest monk "Sheikh", known for his wisdom. They built in the middle of each Manshoubia a church, in which they gather for worship and prayer on Sundays. After Saint Anthony passed away, his students built the Monastery of Saint Anthony by the red sea [1].

The second community bloomed on the Nile valley in Thebaid (ca. 320) by Father Pachomius (290/346 AD), inspired by the imperial army [11]. Father Pachomius led to a major movement in communal monasticism in Egypt by constructing the first monastic enclosure on the east bank of the Nile river substituting the solitary hermit life by a total-Cenobitic life, through a daily based program for praying and working. Father Pachomius had a different perspective for monasticism, allowing

monks to share each and every aspect of life. Every three monks shared the same room, they were divided according to their specialization into groups (workers, farmers, chefs...etc.). All monks in this new enclosure pray together in one church, eat in a refectory, and no one was allowed for any solitary activity, nor break any rules. This was the first uniform communal regime known worldwide [12].

After Father Pachomius passed away, his ideological successor was Father Shenoute (348/466 AD). Father Shenoute found that the two Cenobitic systems should be merged into one model, as both do not contradict but helps to develop each other. He believed that Pachomius rules for the closed Monastery helped the self-sustained community to survive with all its architectural elements, but every monk shall have his own solitary private life as Father Anthony believed. Thus, in Father Shenoute Monastery, every monk has his own room, where he could have his private loneliness life in prayer. While, monks share work and special prayers every day as a regime. Also, some elder monks were allowed for a total solitary life in the desert, but in certain known locations [1].

Hence, Monasteries great evolution as an economical self-sustained community bloomed in the twentieth century by Pope Shenoute III (1923/2012 AD), the 117th Pope of Alexandria and patriarchal evangelism of Saint Mark. Pope Shenoute III believed that education is the keynote of any community to evolve. That's why he had added new regulations for any man to be a monk. Importantly, anyone who is interested to enter the Monastery must finish his/her bachelor's degree. This ensures a new well-educated generation, which will help the development of Monasteries in all aspects. Nowadays, this new generation of (engineers, doctors, scholars...etc.) helps Monasteries to be listed as a successful self-sustained settlement. Today Monasteries became productive settlements having poultry farms, livestock farms, apiaries, fish farms, citrus farms, and automobile repair workshops using the latest technologies, that not only serve the Monastery, but also enhance the economic aspect by selling their goods outside. Coptic monasticism timeline was analyzed through historical references, to understand the chronological order and the origins of monasticism idea, that was reflected architecturally into Monasteries seen today (Figure 1).
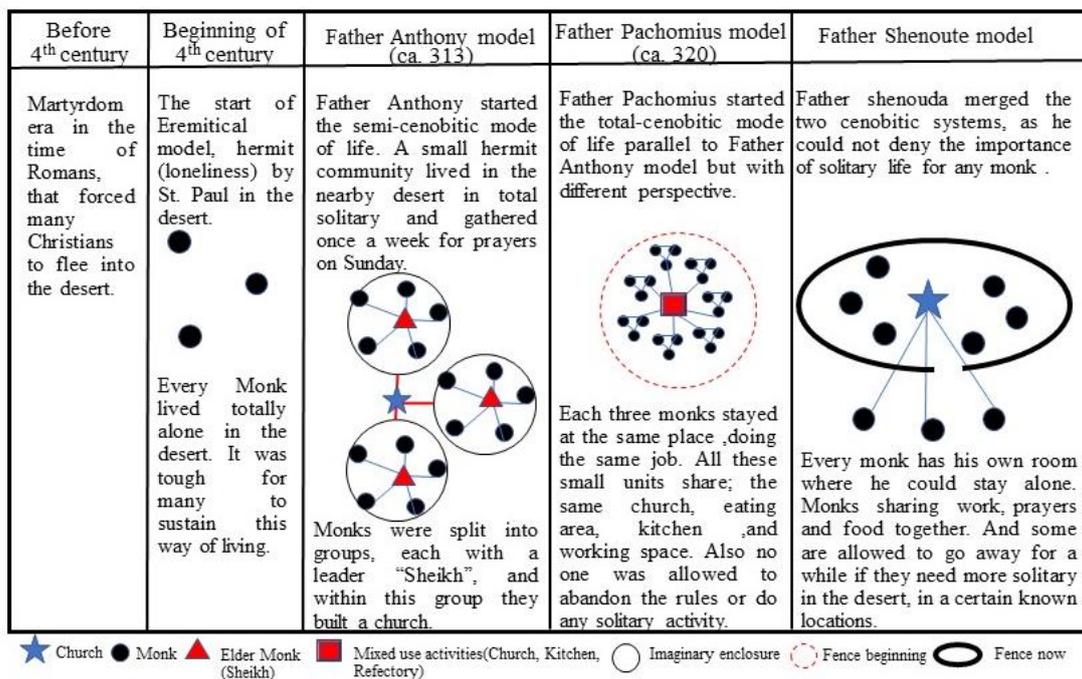

Before 4th century	Beginning of 4th century	Father Anthony model (ca. 313)	Father Pachomius model (ca. 320)	Father Shenoute model
Martyrdom era in the time of Romans, that forced many Christians to flee into the desert.	The start of Eremitical model, hermit (loneliness) by St. Paul in the desert. Every Monk lived totally alone in the desert. It was tough for many to sustain this way of living.	Father Anthony started the semi-cenobitic mode of life. A small hermit community lived in the nearby desert in total solitary and gathered once a week for prayers on Sunday. Monks were split into groups, each with a leader "Sheikh", and within this group they built a church.	Father Pachomius started the total-cenobitic mode of life parallel to Father Anthony model but with different perspective. Each three monks stayed at the same place ,doing the same job. All these small units share; the same church, eating area, kitchen ,and working space. Also no one was allowed to abandon the rules or do any solitary activity.	Father shenouda merged the two cenobitic systems, as he could not deny the importance of solitary life for any monk . Every monk has his own room where he could stay alone. Monks sharing work, prayers and food together. And some are allowed to go away for a while if they need more solitary in the desert, in a certain known locations.

★ Church ● Monk ▲ Elder Monk (Sheikh) ■ Mixed use activities(Church, Kitchen, Refectory) ◯ Imaginary enclosure ⬭ Fence beginning ⬭ Fence now

Fig. 1:Timeline analysis of Coptic monasticism.

2.2. Geographical location of Cenobitic modes

Through analyzing historical references, there was a chronological development for Monasteries to reach the self-sustained community of today. The north semi-Cenobitic mode of life established by Father Anthony, consisting of the Red sea (ca.318), Nitria (ca. 330), Scetis (ca. 330), and Kellia (ca.

338). The south total-Cenobitic mode of life, started by Father Pachomius, was around the Nile valley in Thebaid (ca. 320) all the way down to the south (Figure 2) [11].

Fig. 2: Location of Anthony and Pachomius monasteries [13].

There were no architectural remains of Nitria, as the historical site was destroyed by irrigation water that covered the whole site [1]. The first architectural vestiges for Anthony monasteries were found in Kellia, which was made for three, then ten monks[14] .

There are no traces of architectural records for Father Pachomius monasteries. Monks destroyed the old buildings to replace them with new buildings, to accommodate their need for life, and to house the increasing number of monks in Pachomius monasteries.
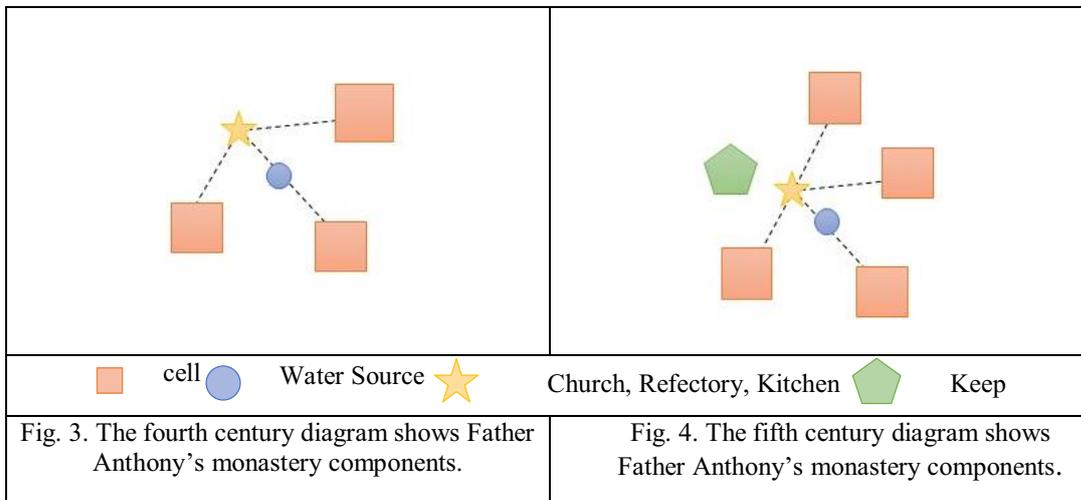
3. Differences between Father Anthony, and Father Pachomius monasteries
Based on historical references, Coptic monasteries could be distinguished according to architectural relationships. Understanding the architectural differences between the two models of Cenobitic life will facilitate recognizing whether the monastery belongs to Anthony or Pachomius from the architectural plan. There are two Cenobitic modes of life, the first was semi-Cenobitic by Father Anthony while the second was total-Cenobitic by Father Pachomius.
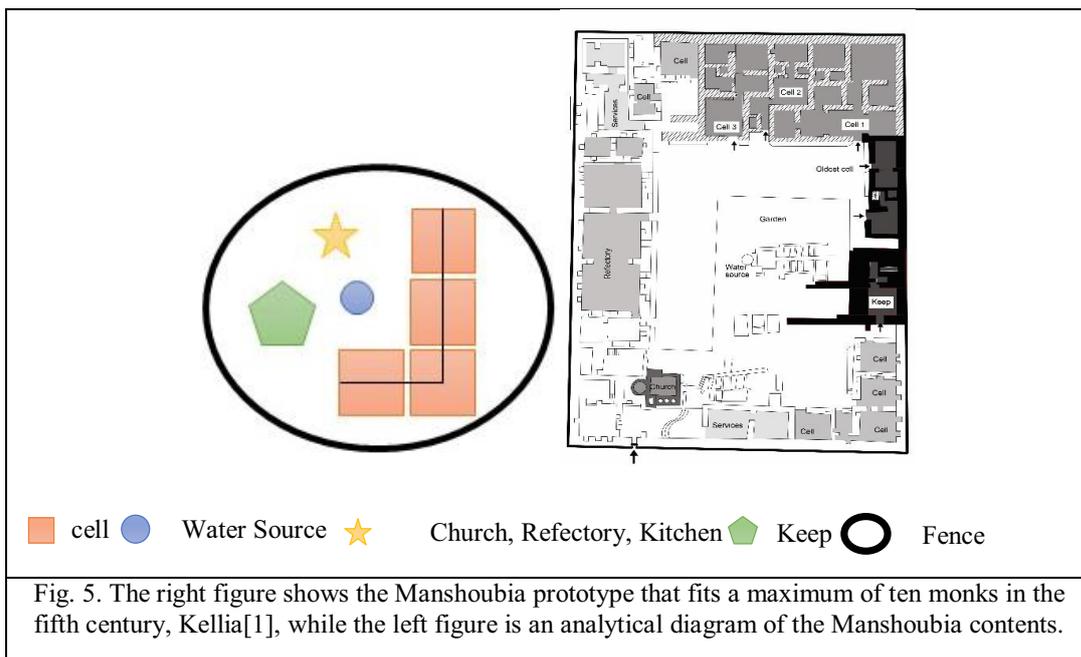
3.1. Semi-Cenobitic mode of life by Father Anthony
The first architectural evidence of Anthony monasteries appeared in Kellia excavations that divided Father Anthony monastery into periods that reflect the architecture of each era. In the fourth century, this hermit's community lived in separate built cells, besides a water source, in a solitary life. Every cell had two spaces, one for prayer and sleeping, while the other was a reception for visitors. A kitchen was added to this cell and a staircase leading to the second floor, where toilets were added. This community built a church and a refectory in its center, to share Sundays prayers (Figure 3).

In the fifth century, the Keep (fortress) was added to this community due to multiple Bedouins and Barbarian attacks that cause the death of many hermits. The Keep was known for its large walls, with only one door on a high level for entrance using a removable staircase, and a reachable water source from the inside (Figure 4).

Fig. 3. The fourth century diagram shows Father Anthony's monastery components.

Fig. 4. The fifth century diagram shows Father Anthony's monastery components.

Since the middle of the fifth century, until the beginning of the sixth century the primary monastery known as "*Manshoubia*" appeared with all its elements that fit from three monks until it reached ten monks. This new monastery was fenced and contained multiple separate cells, *Keep*, water source, church, refectory, and a big court for vegetation (Figure 5).

Fig. 5. The right figure shows the Manshoubia prototype that fits a maximum of ten monks in the fifth century, Kellia[1], while the left figure is an analytical diagram of the Manshoubia contents.

The monastery of Abu Makâr

This monastery is located in "Scetis" Wadi El-Natrûn, south of Alexandria. The monastery of Abu Makâr is one of the oldest surviving monasteries following the semi-Cenobitic model of Father Anthony. This Monastery was built in the fifth century after the third barbarian attack 444 A.D which caused the death of many monks [15]. This was the first Monastery that has been visited by people after the Pope of Alexandria moved to live there 451 A.D. It has evidence of the old and the modern monasteries.monasteries of Wadi El-Natrûn were built as an example of a small fortress, its nucleus is

the church; furthermore, fences function were changed nowadays from defensive to the private idea [16]

The plan drawn by Evelyn-White for the Abu Makâr monastery in 1933 A.D (Figure 6) shows that the cells were designed on multiple longitudinal axes. Every cell is totally separated from the next cell, to respect the solitary life of each monk. The cells overlook an intermediate court, vegetation with a well in its center, the kitchen and the refectory were connected. There are three churches built in different eras in the monastery. The Keep was part of the walls of the monastery, with huge walls approximately 3.5 meters of depth. The height of the monastery's walls was 14 meters, while the Keep was 16 meters. Also, there was a mill, and stable used for the daily work of monks. Monks came together on Sundays to share prayers, and eat together.

Each architectural element in Father Anthony's monastery is independent. It is shown that cells are away from the Keep, services (kitchen, refectory, and guesthouse) and the church. This type encouraged the solitary life of monks. Workshops didn't appear as an important architectural element in the plan, although this could not deny the importance of work for any monk in Anthony's monastery. They worked as farmers to plant their food, and manufacturing baskets out of palm.

Fig. 6. Abu Makâr old monastery in Scetis since 1933 [15].

3.2. Total- Cenobitic mode of life by Father Pachomius

Father Pachomius built his monastery in the fourth century. His monastery was fenced and divided into two main parts: living area which was the Keep that included (cells, refectory, and kitchen), and workshops. In all Pachomius monasteries, workshops occupied a large area of the plan. As Father Pachomius believed that work is important for any monk. Monks were divided according to their work into groups, they shared daily activities, and they strictly followed the monastery rules.

Saint Simon monastery in Aswan

This monastery is one of the rare Pachomius monasteries that survived without changes in architectural form or function, as it was abandoned by monks for a long period. This monastery was located on the Nile river bank. Due to the special topography of the land, the Monastery was levelled on two terraces. The upper terrace is accessed from the land side, while the lower terrace is accessed from the Nile riverside. There are three components in the plan; Fig. 7a the keep, the church, and the workshops. This emphasizes that the bigger part of the plan was the workshops. The upper terrace of the plan; Fig. 7b is divided into two parts. The first part is the keep: where the living area, kitchen, and the refectory are located. While the second part has workshops. The church is on the lower

terrace. The cells were divided according to monks' work in a linear alignment; they shared everyday life. The monastery organization reflects total-Cenobitic life. work was a basic life regime [12].
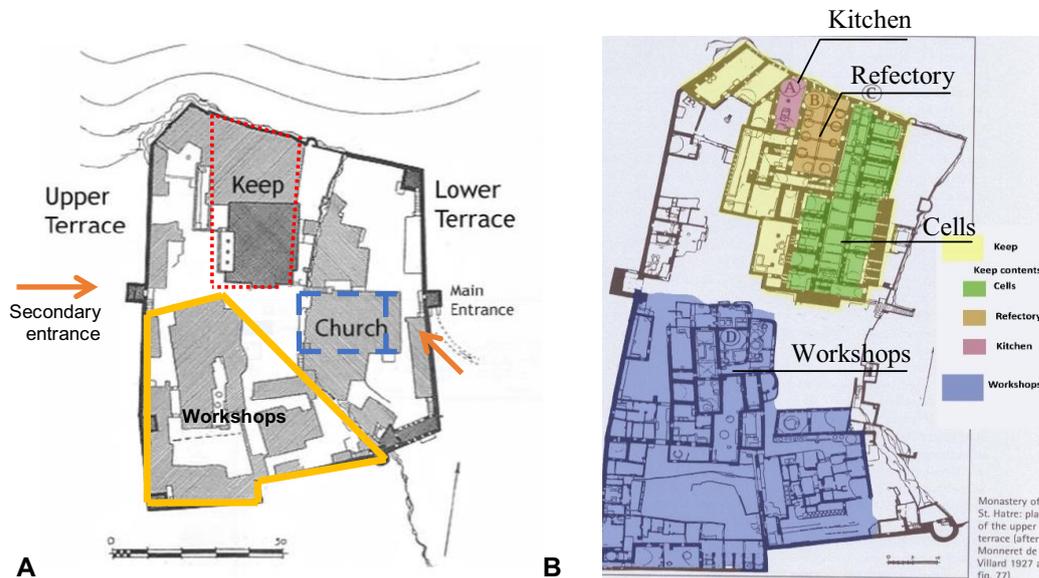

Fig. 7. "A" Saint Simon monastery master plan, Aswan [17], analyzed by Author." B" Saint Simon monastery upper terrace, Aswan [18], analyzed by Author.

By understanding the two main concepts of Cenobitic life it is obvious that Pachomius and Anthony's monasteries share the same architectural elements, but with different plan organization. The main elements of monasteries are: the water source which was important for the survival of any community, the cells, where monks live, and had their spiritual solitary life, the keep (fortress), where they shelter of attacks, the fence appeared in the fifth century after the third barbarian attack [3], the church was the base of this Cenobitic life, where monks had their communal weekly prayers, the refectory and the kitchen were of great importance to this Cenobitic life, where they shared food and prayers after the holy mass.

Work has been important to the monastic system, it helped occupy the empty time of monks, and provided the monks with economic sustainability, and probability to improve their community. The cell design is one of the most important differences that could differentiate Father Anthony and Father Pachomius monasteries.

Shenoute the Great (347- 465 A.D), Father Pachomius successor, was the abbot of the White monastery in Egypt. Shenoute found that the two Cenobitic systems should be merged together in one model, as both models do not contradict but help develop and sustain each other. He believed that Pachomius rules for the total-Cenobitic monastery helped this community to survive sustainably through rules and economics. Furthermore, every monk shall have his own solitary private life as part of his daily regime, to ensure the sustainability of the essence of Coptic monasticism, as Father Anthony believed. Thus, in Father Shenoute monastery, every monk lived his private life in prayer, while sharing other prayers and work with the whole group [19]. Thus, the second part will concern studying the living quarters' design in a monastery, according to Anthony and Pachomius monastic systems.

4. Living quarters

Pachomius monastery cells were arrayed linearly. Monks share every aspect of life from food, work, and prayer. The refectory and the kitchen were connected to the end of the group of cells; to emphasize the total Cenobitic life; Fig. 8a. While Anthony monastery cell design was based on the solitary life of each monk; their daily needs were all in the same cell (living area, kitchen, and toilet on the second floor). The monastery complex had one refectory and kitchen connected to the church,

used once weekly after the holy mass; Fig. 8b, [1]. The new Shenoute (347- 465 A.D) cells in monasteries respect the solitary life of each monk. Each cell contains all its functions which allow the monk to live privately in the monastery; Fig. 8c.
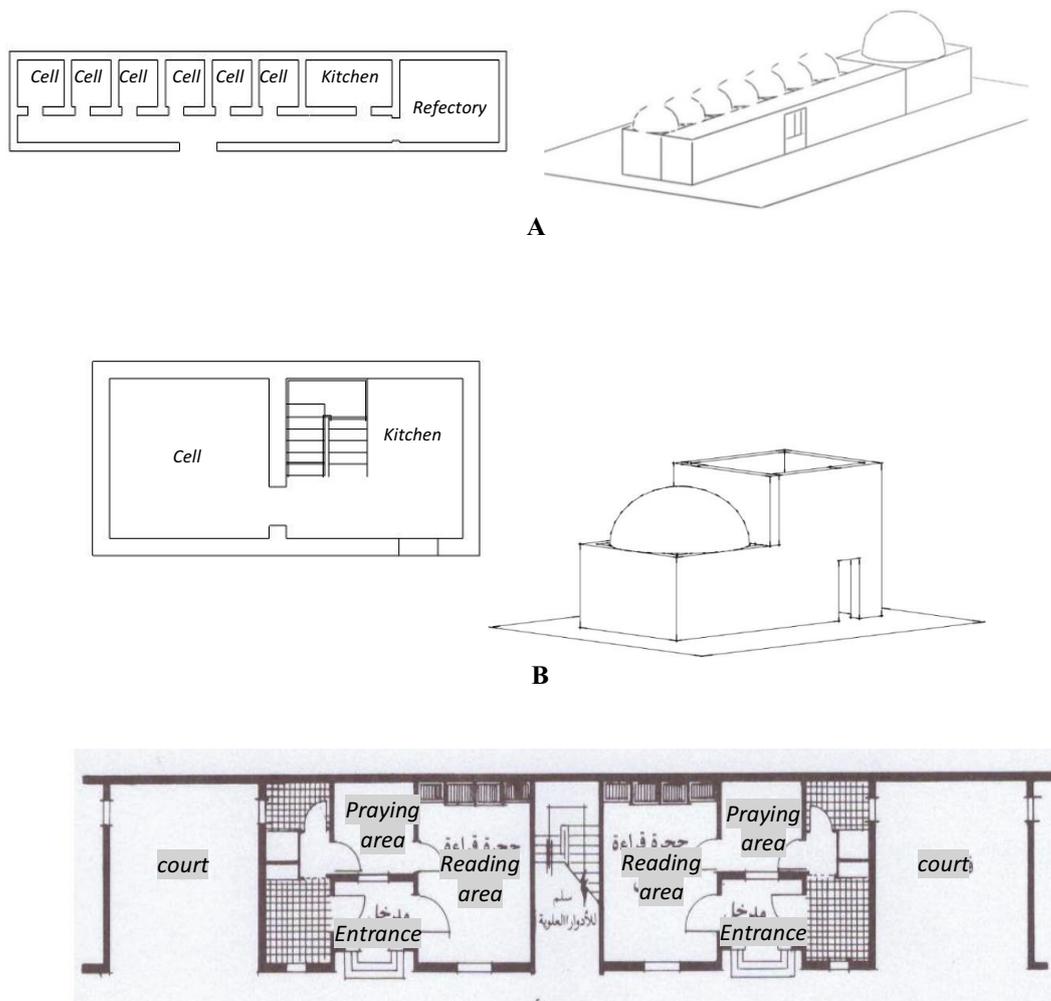
Fig. 8. Different cells design. "A" Father Pachomius total Cenobitic cell design (plan, and perspective). "B" Father Anthony prototype solitary cell in Kellia (plan, and perspective). "C" Abu Makâr cell plan [1], analyzed by Author .

5. Abu Makar monastery as an example of Self-sustained settlements

Sustainability is the ability to survive over a period of time, causing no damage to the environment [20].

Abu Makâr monastery is one of the oldest monasteries that survived sustainably since the fourth century. This monastery was built on the semi-Cenobitic mode of life by Father Macaruis. Abu Makâr was the first monastery visited by people after the patriarchal evangelism of Saint Mark moved to it. This monastery is one of the leading examples of self-sustained settlements through time. Analyzing Abu Makâr monastery since the fourth century till nowadays, sustainability was found in all aspects

of the monastery. Abu Makâr monastery could be considered as a self-sustained community in its architectural elements, building materials, zoning, architectural design, and economics.

Comparing the twentieth century 1933 plan referenced by Evelyn-White (Figure 6) and the renovation new plan of the monastery (Figure 9), the main architectural elements remain the same, but new elements were added to sustain this new life. All elements respect the solitary life of a monk. While workshops became of great importance.
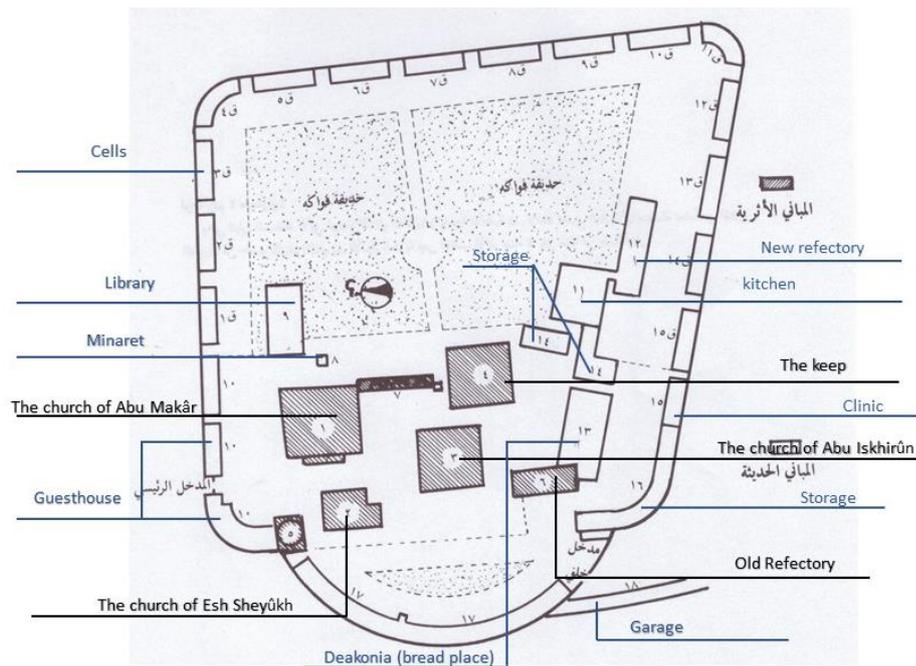

Fig. 9: Abu Makâr new plan analysis [1], analyzed by Author.

Abu Makâr monastery used vernacular materials like limestone. Bricks were made from Tafla mixed with sand and sometimes with sand and lime. Their sizes were (40x20x7 cm) or (42x42x10 cm), and the mortar was clay taken from some lower layers of the ground. The floor of the cell was a deck of gravel, gypsum, and ochre. Monks used insulation materials from nature to create cool and comfortable interiors [1]; Fig. 10a.

Abu Makâr was the first visited monastery by people, zoning was of a great importance for these monks to sustain their solitary spiritual life. The new layout of Abu Makâr monastery emphasizes the separation of public areas of visitors from private areas of monks, to maintain their solitary life. Due to climatic changes, the levelling of the monastery has changed. The new monastery level was higher than the old by six meters. Also, Traces of the old fence act as the entrance to the old monastery, which serves as a natural separator; Fig. 10b. The new design of the monastery was made respecting to the primary designs, and to sustain climatic changes. The fence was built on the trace of the old monastery. Cells were built to reinforce the fence and prevent its destruction. Every group of cells was made of three floors facing the fence, which act as pillars supporting it [1].
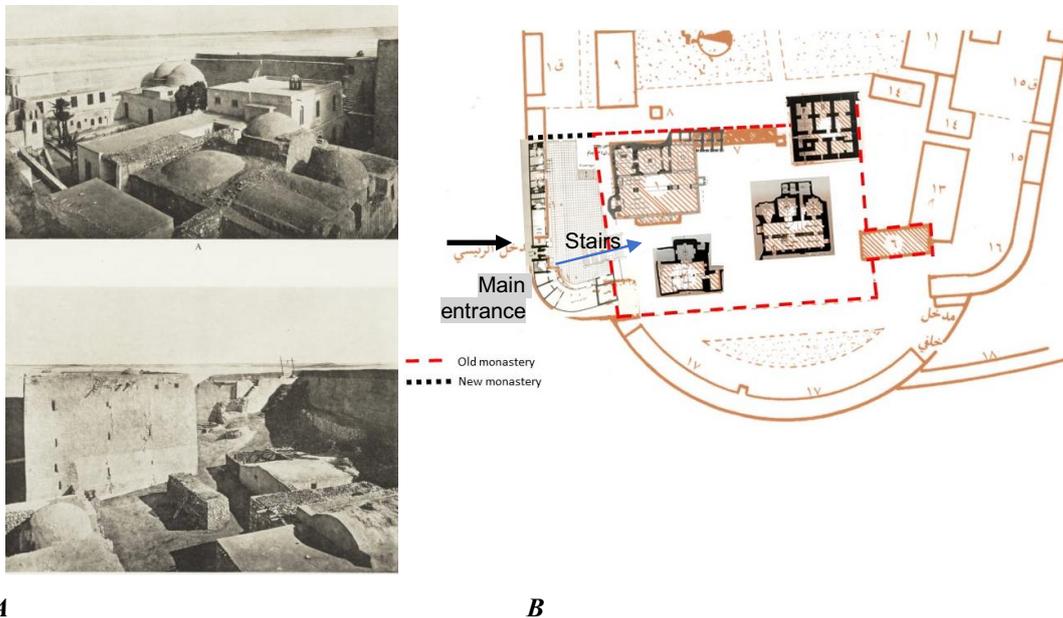
A   B

Fig. 10. Abu Makâr monastery. "A" interior photo[15]. "B" New Zoning monastery, analyzed by Author.

Conclusion

This paper presents monasteries as self-sufficient, and self-sustained settlements survived through history. The main architectural elements to form a monastery since the fourth century are: church, refectory, kitchen, water source, cells, Keep and fence. The fence main function changed from a protective to a space defining element that ensures privacy.

The architecture of father Anthony monastery provides privacy for all the elements in the main plan, where the cells were far away from the church and the kitchen. This monastery design ensures the solitary life of each and every monk.

On the contrary, the architecture of father Pachomius monastery enhances the community collaboration, where monks share every aspect of life, therefor all the architectural elements aligned together.

The main difference between father Anthony and father Pachomius monasteries is the cell design. The cell design in Anthony's monastery stands alone with all its functions in it: reception, sleeping area, kitchen and toilet; where a monk could stay in privacy for a long period of time. The cell design of Pachomius monastery was on a longitudinal axis where all cells are aligned sharing same kitchen, toilets, sleeping and prayer areas.

Monasteries of both models used vernacular materials from the site and applicable architectural techniques. These monasteries evolved through history with respect to the identity and authenticity of the place. Furthermore, the topography of the land acts like natural barriers or defender in the monastery design.

Nowadays, the main architectural elements of monasteries did not change but new elements were added to accommodate the new aspects of life as clinics, guests house and workshops, in respect to the solitary life of each monk. Zoning was applied on old and new monasteries in their architectural design where visitors may enter any monastery without accessing private areas of monks.

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