An Introduction to the Maritime Construct of Khashabat in the Persian Gulf

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Abstract

The history of maritime routes and communications in Iran dates back to a long time ago. In ancient times, to prevent dangers for their ships such as water thinness and thawing near coasts, the shallow depths and narrowness of rivers at the mouth of seas, Iranians installed a mechanical device called khashabat or Khushab (lighthouse). This maritime device has been made out of teak wood in the form of a catapult and imperfect pyramid. The height of a khashabat was about 40 meters above the sea level. Its materials were pottery and stones. The watches on a khashabat were deployed in four-arched chambers on its top. The significance of the khashabat was because of natural disasters, the invasion of pirates, and expiration of their fuel. Historical resources indicate that khashabats or lighthouses in the sea exited until the 13th century. The present study is aimed at investigating functions and significance of khashabats in traditional cruise and the reasons for their construction. In addition, places where this Iranian technology and engineering were used are introduced.

Key words: Khashabat, the Persian Gulf, navigation, maritime hazards, lighthouse.

Introduction

The history of technology is just a small part of the profile of the human civilization in their temporal visions, but it is an important part of human culture and civilization as well. Therefore, investigating the history of Iranian technology is very significant. Iranian culture is very rich in terms of maritime technology and shipbuilding. Waters of the Persian Gulf, Oman Sea, Indian Ocean, and rivers in the southwest of Iran have been scenes for people's navigation since the ancient times.

According to myths, Jamshid Jam, from the Pishdadian Dynasty, built the first ship. He also established the first “maritime rituals” and other national rituals for leading people toward seas and navigation. He then started sailing and navigation in seas*** and sailed from one country to another.[1] (Ferdowsi, 1966:27) According to Ferdowsi’s narration, after the transfer of government from Pishdadian to Kianian dynasties, occurrences of events changed from Sarandib to Hamavaran. During his travel to Iran, Kay Kavus passed Zabol (Nimrouz) and reached Makran coasts and decided to suddenly invade Hamavaran:

> “Key Kavus ordered the army to play drums and proceeded from Nimrouz*** Then he, the King of the world, became happy
> He deployed his army toward Turan and China*** and then he invaded Makran.[2]
>
> Then the king ordered shipbuilders to build boats and ships. The king and his army boarded and passed seas a thousand miles until they reached a land.
>
> Key Kavus ordered shipbuilders to build abundant ships and boats***and then he deployed his army to invade
> The people of Hamavaran were informed that*** Key Kavus and his army were invading from the Makran Sea”.[3]

Sailing in Iranian waters was common in the Phoenician, Elamite, Achaemenid, Parthian, and Sassanid times, as well as during the Islamic era. With a glance at the sailing tradition, shipbuilding and using maritime devices have been common in Iran since the ancient times.

Many maritime and shipping instruments were created by Iranians, and some other instruments were used by Iranian sailors who traveled to other lands in the ancient era. Compasses, steerages, depth finders, distance finders, measurement tools, flyers (drawings), electric pellets, and khashabats (marine lights) were among instruments innovated by Iranians

(Nourbakhsh,2003:75 and 81, Raein,1976:288-289). The present study aims to investigate the functions and applications of khashabats, as one of the most important innovations and instruments of Iranian sailing in the shipping industry of those periods based on historical resources.

a. What is a Khashabat?

The word “khashabat” (خشبات) which is the plural form of “khashaba” (خشبه) means sea minarets. They are in a place behind Abbadan (Dehkhoda, 1998:9802). A khashaba literally refers to a piece of wood. It also refers to a ship metaphorically. But generally in resources such as Murravej ul-Zahab of Masoudi and other geographical resources, the term khashabat refers to a minarets of wood established as a wooden scaffold in the sea, and the fire was lit on the top of it in a small chamber. As a result, it led ships toward safe passages. It in fact was equivalent to a lighthouse in the modern shipping era. Nowadays there are some maritime guides-being lit at night by wires and power- which are called “Bayeh”, but they are floating in the sea (Hadi, 1992:180).

b. Navigating and trading in the Persian Gulf

The maritime routes of the Persian Gulf is the most ancient connecting maritime routes in the world. They have been connecting Central Asia to the Middle East since several thousand years. Since the very ancient times, Chinese, Indonesian, and Malayan, and Indian, and African, goods have been shipped with the efforts exerted by Iranian sailors to ports in the Persian Gulf such as Bayan (Lian), Oboleh, Riv Ardeshir, and Forat Mishan ports and were unloaded there from where those goods were transferred to Palmira and Syria. Sometimes windships headed toward their destination through the bay in the west of Iraq and stretched out to

Al-Hirah and unloaded their goods near that city which was the dock of caravans from Badia –al-Arab.

Since that time, the Persian Gulf, as currently known for its oil reservoirs all over the world, has been famous for connecting trade routes in the east to the west of the ancient and modern world (Rasaei, 1972:42).

c. Reasons for the advent and construction of khashabats

To build a light to guide ships in dangerous and difficult passages, human beings thought of fire and light; therefore, lighting and igniting wood were some strategies for guiding ships and fleets. Then, human beings succeeded to use viscous black liquid, also called petroleum (from Greek: petra: "rock" + oleum: "oil".) for igniting fires in seas. However, since this liquid was flammable, it was poured in special containers or holes were delved in heights and it was poured into those holes and ignited (Rasaei, 1972:40)

Indeed the geographical situation of soils in the head of the Persian Gulf was not like the present time. In the ancient time, downstreams of the Euphrates, Tigris, and Karun rivers were separately poured into the Persian Gulf; as a result, salty water of the sea spread out the surrounding lands through bays stretched out near Basra even in the Sassanid era (Rasaei, 1972:42). In addition, the Persian Gulf is more roaring than other seas because of its shallow depth and its rugged submarine topology. The Persian Gulf joins the Indian Ocean (Eghtedari, 1966:10).

Thus the ancient Iranians thought of finding safer routes for facilitating navigation, preventing damages to ships, and guiding ships toward northern parts of the Persian Gulf. As a result, they constructed a type of maritime guide board called “khashabat” in historical resources.

In addition, in the guidebook of Rani Kia Tan, written between 785 to 805 AD, it is mentioned that Iranians constructed special towers in the Persian Gulf and ignited them at night for guiding ships and boats. The flammable

materials used for igniting those towers were unknown but they could be wood or petroleum (Hadi, 1992:170).

Professor Hadi Hassan quoted from Hiret Veracqui, the author of the book *the Chinese and Arab Trade in the Twelfth and Thirteenth Centuries* that a ship is made out of wood and a shipmaster is a human, as there are land mice, there are water mice as well, and there are bandits as there are pirates. In addition, there are other hazards such as typhoons and rocks. Therefore, there were some decorated columns in the Persian Gulf which were ignited in order to guide ships toward true destinations" (Hadi, 1992:171).

According to Muqaddasi, in 985 AD around Basra, people constructed chambers on palm trees and ignited fire in them in order to prevent the crash of ships with rocks. But since it was difficult to navigate in that area, ships sailed mostly in days in such a way that shipmasters climbed decks and watched the horizon. Then, they transferred their commands to helmsmen to steer ships. However, when their ships got away from coasts and reached the sea, they had to steer their ships via the sun, the moon, and stars (Muqaddasi, 1897:17).Those khashabats were established and worked until the thirteenth century.

The most important reasons of constructing khashabats can be as follows:

1. Specific geographic features of the north of the Persian Gulf;
2. The sea level rise in the Persian Gulf in the bay stretching out Basra and the shallow depth of water;
3. Prevention from big ships' grounding in muds which the Tigris, Euphrates, and Karun rivers carried from mountains and embedded at the mouth of the head of the Persian Gulf;
4. Determination of the shipping routes in shallow areas of the Persian Gulf at night; and
5. Protection of commercial goods exported from or imported to the area.

d. Geographic range of khashabats in the Persian Gulf

In this section, the study is to investigate in which areas of the Persian Gulf khashabats were employed.

Distribution of khashabats in the Persian Gulf until the 13th century

Darius the Great ordered that the first lighthouse be installed at the mouth of Indus River under the supervision of Scylax. When Nearchus, Alexander's Admiral, sailed into the Persian Gulf in 326 BC, he was astonished by great lighthouses. As a result, he praised the miracles he had observed in the area in his travelogue. According to Nearchus, Iranians' lighthouses were installed in different parts of the Persian Gulf (Nourbakhsh, 2003:77). The Persian Gulf was considered as a part of the fourth gulf of the Bahr ul-Azam Sea. In the book *Hudud al-Alam*, The Persian Gulf is described as "a gulf with narrow width which stretches out Indus River" (Sotoudeh Ed, 1960:12).

Muqaddasi writes in the book *Ahsan al-Taqasim* that khashabats' origin is thought to be from Basra. They are very shallow and dangerous. Wood columns were installed and chambers were built on top of them. At night, the fireplaces were lit to warn them not to approach. Muqaddasi writes also that a captain once said that there were a lot of calamities there; his ship grounded several times. Only one ship out of 40 ones can return from there (Muqaddasi, 1982:18).

Nasir Khusraw who voyaged to Mahrouban Harbor via Basra in a ship in 1051 observed khashabats and attributed their constructions to ancient kings. He narrated that when they voyaged from Basra in May 1051, firstly they boarded a boat and voyaged for four miles to reach Abbadan (Abadan). Abbadan was close to the sea as an island with two branches. As they approached and anchored, they saw some towers and asked

natives what were they? They answered them that those towers are khasbabats (Ghobadiani, 1976:161).

Soleiman Sirafi writes in the book *Sequence of Histories* (Silsilat ul-Twarikh) that the beginning of the Persian Gulf was the area of khashabats of Basra. That area covered Basra, Oboleh, and Bahrain. Then, there was Laravi Sea beside which there were khashabats of Saymur, Subareh, Taneh, Sandan, and Konbayeh regions which were parts of India and Indus River. The beginning of the Perisan Gulf there was maritime rugged topologies around Basra where khashabats or konkalas had been installed. Those khashabats were constructed out of wood in order to be guides for sailors and helmsmen. The distance from the beginning of the Persian Gulf to the Oman Sea is about 300 miles. In addition, the distance from Persian coasts to Bahrain is about 300 miles (Sirafi, 2002:160).

In his observations of the Persian Gulf from 947-956, Masoudi describes its range as follows: “the beginning of this sea starts from Basra, Oboleh, and Bahrian where areas of khashabats of Basra are located. Therefore, the beginning of the Persian Gulf is from khashabats of Basra, also called Konkala, that are signs made out of wood and installed in the sea. The distance form this area to Oman Sea is about 300 miles” (Masoudi, 1864:147).

According to the above discussions, it can be concluded that marine lights were mostly employed at the head of the Persian Gulf. In most historical and geographical resources, the area of using khashabats were Basra, Oboleh, Abbadan (Abadan), Mesopotamia[4] (Hamavi,1987:239), Bahrain, Mahrouban, Siraf, and even Masqat, and Sohar[5] in Oman and at the mouth of Indus River. All in all, it can be claimed that khashabats were constructed and established at the mouth of big rivers ending in Persian Gulf from where muds and sediments entered the sea and resulted in

creating bays. In the Persian Gulf where the Tigris, Euphrates and Karun rivers reaches each other, a relatively big bay is emerged. As a result, the sea becomes shallow. This issue results in problems for ships. Iranians solved this problem in the Persian Gulf using khashabats. [Fig. 1]

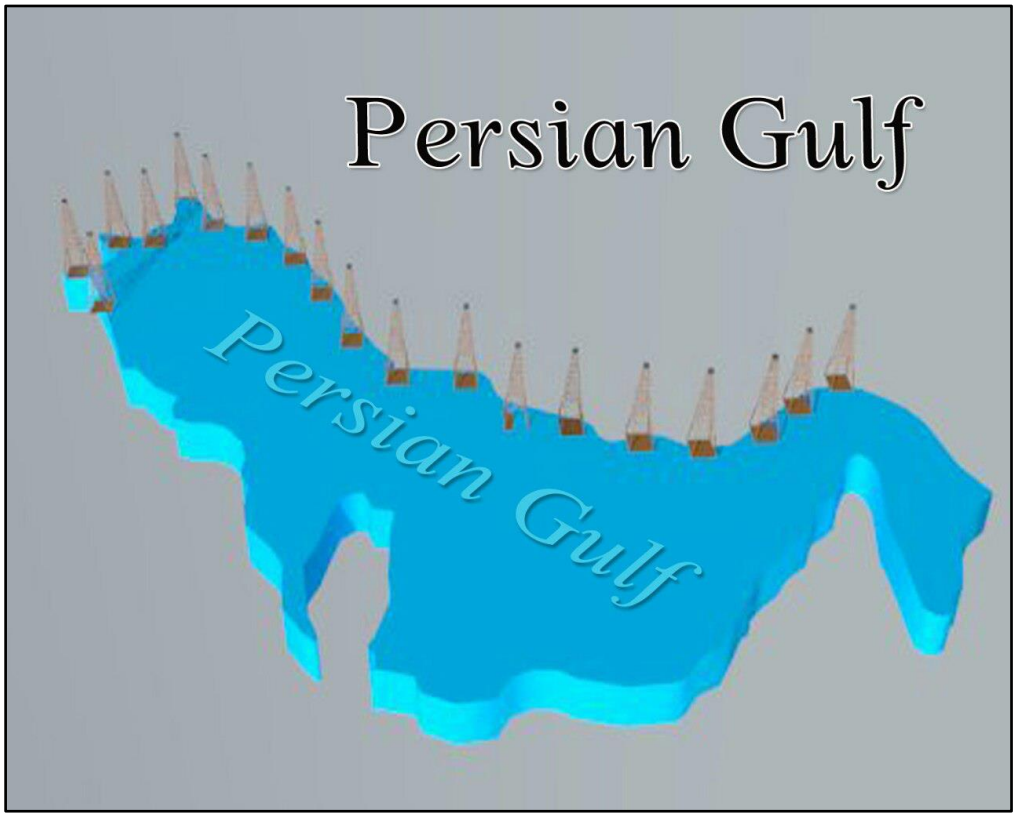

Fig.1: Geographic range of khashabats in the Persian Gulf.

e. The structure and features of khashabats

Nasir Khusraw who visited khashabats, describes their structures:

> "[t]heir columns are four big teaks like catapults with wide bases. Their heads are narrow. Their heights above sea level are about four feet. On their tops, there are stones and pottery containers fastened to each other with wood. They are called khashabats[6]. Some people say that they were constructed by a merchant and some others say they were constructed by a king. Nevertheless, they both had intentions: to save ships from getting stuck in sediments of that area, and secondly to warn them of pirates. When we passed by khashabats, we saw a Nabeh without any dome. After that, were reached Mahrouban" (Ghobadiani, 1976:163).

Hafiz-i Abru describes khashabats as follows:

> “khashabats exist near Abbadan- around Basra- where marshes and drainage of the Euphrates and Tigris rivers poured into the sea. The distance from Abbadan to that place is about six miles. The depth of the body of water in that area is shallow; thus ships may be in danger. In those locations, timbers have been raised up as catapults. The bases of those khashabats are reinforced with a lot of pieces of wood. There are domes of pieces of wood for watches to ignite fires on the top of those khashabats. Those khashabats cannot be seen in days because their distances is very far from the coast. The mouth of the Tigris River is the border where ships must not trespass” (Hafiz i-Abru, 1996:239).

As discussed, the structural features of khashabats can be explained as follows:

- Each khashabat (lighthouse) had four bases made of wood[7]. Wood has been used as one of the materials in Iranian buildings since the ancient time. Wood was used in chambers of royal emirates in Shush and Persepolis in the Achaemenid era (Farsahd, 1987:730).
- In the design of khashabats, the quadrangular bases were underwater. As they went up, the quadrangular got smaller, that is to say their heads were smaller than the bases. This design was adopted for the increase in the strength and resistance against typhoons[8].
- Their heights were 40 meters above the sea level.
- On the top of them, there were dome shaped and pottery-roofed cubicles for watches.
- In their cubicles, there were places for igniting fire.
- The distance of one khashabat with another was in such a way that when one of them was out of sight, another appeared.

f. The function and significance of khashabats in navigation

With regard to descriptions and explanations of Muqaddasi, Nasir Khusraw, Soleiman, and Sirafi, Hafiz i-Abru, and other historians and geographers, it can be inferred that khashabats and lighthouses were of two types which in spite of commonalities in goals and duties, they had

different functions. Apparently, one type of khashabats were merely used for watches; therefore, ignition in them seems unlikely because the fire for guiding ships must have been very big to be seen by captains. On the top of that type of khashabats, there were some tombs and chambers as shelters for watches. The significance of khashabats type one is in their determination of shallow places of a body of water and the existence of underwater big rocks. In addition, sailors and watches in those khashabats were responsible for transferring news about the coming of ships to officials in ports or in case of observing pirates, they informed military bases to fight them. Therefore, khashabats had military functions as well. [Fig. 2]

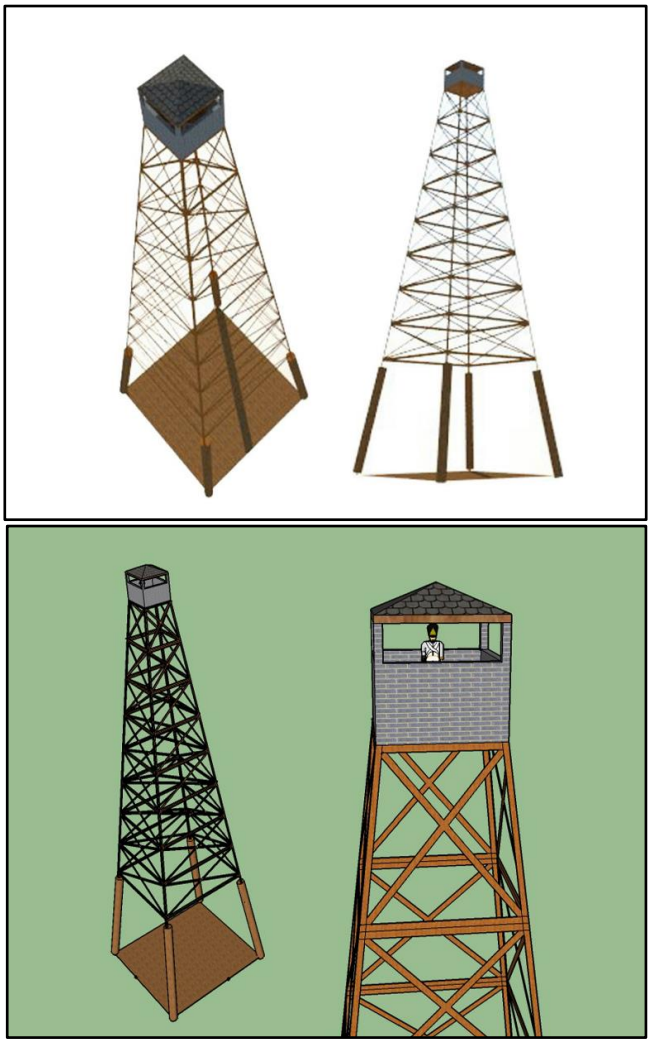

Fig. 2: The khahsbats type one. (Artwork: Nahid koohi)

But the khahsbats type two were lacking in chambers and tombs because fire was ignited on the top of them. However, there were some officers responsible for igniting fire at night. The significance of this type of khashabats was for nights because the ignited fires were for guiding ships in order to find their ways at night and in mists, while khashabats type I were used in days. Nevertheless, these two types both had common function of indicating shallow places of a body of water and guiding ships. [Fig. 3]

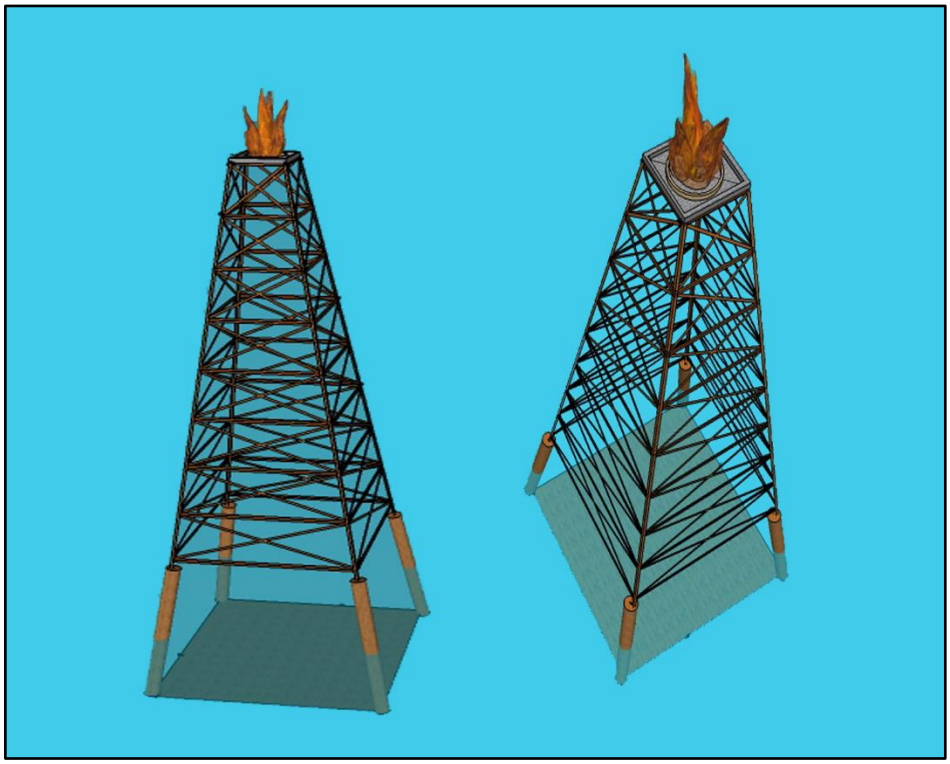

Fig.3: The khahsbats type two. (Artwork: Nahid koohi)

As a result, in can be concluded from the above discussions that khashabats were considered significant in the ancient navigation. Ferdowsi describes khashabats in Shahnama that:

> “Come to explain you what are khashabats***a wise man has established them in waters…
> When a ship observe them from a distance***and see fires blazing out of them...
> It follows the right direction as fires show***and the shipmaster thinks so.”

Therefore, khashabats have been very significant for maritime transportations and the development of business and trades in the Persian Gulf in that the economic life of people living in ports and harbors of the Persian Gulf ranging from the eastern coasts of the Tigris River to Makran plains and Baluchistan, and from the western bank of the Tigris River to southern coasts of the Persian Gulf and around Arab Peninsula as well as those who were known as Babylonian, Sumerian, Arabic, Zangi and Yemeni having lived in other parts of the region all needed the sea and maritime business. As a consequence, residents in the coasts of the Persian Gulf have always intended to find routes, instruments, and technologies for ships to navigate as rapidly and safely as possible, and one of those technologies was khashabats.

Conclusion

According to information obtained from writings and observations of historians and geographers, navigation has been a dangerous profession when ships are approaching coasts of the Persian Gulf. Therefore, in the ancient times (the Achaemenid and specially Darius the Great), Iranians constructed constructions made of wood and ignited fires for signing the ships and warning them of dangerous and shallow parts of the body of water in coasts. In navigation of the previous centuries, this type of construction has been called khashabat. Those khashabats played a significant role in navigation of the ancient sailors in that their structure acted as lighthouses for the current sailors and helmsmen. The distance

of those khashabats from each other was as far as when one got out of sight, the other appeared. The most reasons and goals of constructing those towers were as follows:

1. To guide ships at night by igniting fires on the top of them because when the sea level went up in shallow lands, there was a danger that ships got stuck in sediments of that area;
2. When sailors saw lights in darkness, they could find their ways among mists and darkness;
3. They were used for watching and determining routes for ships in days.

As observed, lighthouses and maritime signs have been one of the innovations of ancient Iranians; therefore it can be assured that current advanced lighthouses and maritime sings mixed with modern technologies and completed with modern advances are rooted in Iranians' intelligence used in the Persian Gulf.

EndNotes

[1] گذر کرد از آن پس به کشتي بر آب *** ز کشور به کشور برآمد شتاب

[2] - بزد کوس و برداشت از نیمروز *** شده شاد دل، شاه گیتي فروز

[3] ز ایران بشد تا به توران و چین *** گذر کرد از آن پس به مکران زمین

بي اندازه کشتي و زورق بساخت *** بیاراست لشکر بدو در شناخت

خبر شد بدیشان که کاوس شاه *** برآمد ز آب زره با سپاه

[4] - An island where Abadan is in its west beside the Aravand River. It was called Mesopotamia. "Mesopotamia means in between rivers and it is a kind of island in lower parts of Basra of which Abadan is a part".

[5] - Iranians called it "Mazun" in the ancient times.

[6] - Khashbab

[7] - They were mostly made of palm trees.

[8]- Its design were in the form of current towers.

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Biography

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