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The Pigeon Towers of Isfahan-Iran.

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Abstract: - This paper aims at examining a different kind of architecture, neither religious nor civil; called the pigeon towers. This kind of architecture is rare and full of beauty and mystery, although in its plan and design it resembles a military unit that extends along the city. As a matter of fact, this vertical architecture is limited mostly to the Iranian plateau. Thus, the sources of its planning are to be the writer's obsession, to clarify whether the design depended on the Iranian heritage building that appeared before Islam 'Ateshgāh', or became to be known through the Armenian architects who came to Isfahan during Shah Abbas period (1587-1629). Along the planning importance, the study will trace the pigeon tower's history, function, material and its main features, depending on the views of the historian, voyager and the remaining pigeon towers that exist in Iran.

Keywords: *Iran, Isfahan, Pigeon, Safavid, Towers, Kapotar Khan, Ateshgāh*

I. INTRODUCTION:

An Iranian architect has created a building just to keep a bunch of pigeons happy"It seems possible that a taboo has already become in existence among the Iranians regarding pigeons. This kind of architecture resembles in its planning and its design the fortes and military corner towers used as a defense system at the main time; many of which can be seen at the borders of the city and near the houses inside the city. Pigeon towers are characterized by their importance to the architectural, artistic, historical, agricultural and economic studies, although most of them have been destroyed because of neglect.

II. METHODOLOGY :

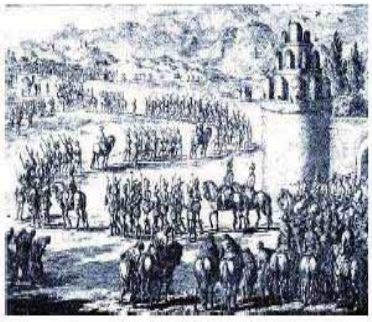
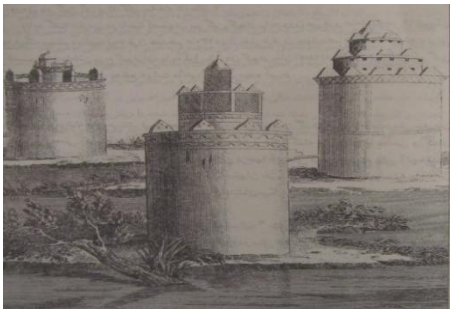
The study aims at clarifying the source of the pigeon tower's plan; whether it depends on the Iranian heritage building before Islam 'Ateshgāh', or it came through the Armenian architects who came to Isfahan at the Shah Abbas period (1587-1629) as some archeologists believe. Thus, the paper will rely on three steps: 1- the historical and travelers' documents concerning Kapotar Khan; 2- a description of the building, classifying it based on types and kinds, which will come as part of the author's field work besides some collective information; 3- a comparative study which is one of the main points of the study problem of the research.
Herein, the pigeon towers are described and analyzed based on:

- Definition of the building's name, kind of hosted pigeons at the tower, and dating of this rare kind of architecture
- The material and function of the pigeon tower
- Description and analysis of the pigeon towers
- The planning source
- Conclusion and facts

The naming:

Pigeon towers[1] had many names in eastern language and many ways of pronunciation, for example Kapota in Pahlavi language, Kapotar in Armenian language, Kapoit in Kurdish language, Kotir, Kavok or Kewulk in Afghani language, Keutar or Kavntar in Blogi language, Kontar or Kapot in Chi language, Kibit in Sericly language[2], however, Kapotar is widely known to be the proper name to pigeons, and Borg –i-hay Kapotar stands for pigeon towers. Pigeon towers are considered as one of waqf sources to provide money for mosques and schools as can be noticed in many cases, like the pigeon tower of Bara'an on Norya Madrassah (school) in Isfahan[3].

[1]) It is known as Kabutar tower, Pigeon tower, Pigeon house, or dovecote.
[2])Mohamed Mahmoudian, Ali Chit-Saz, "Pigeon houses of Esfahan",Kolha, Esfahan,2000, p.23
[3]) Mehrabadey, Abu el-Qasem, Athar Miley Isfahan, Isfahan, 1982, p.503

Picture (1): symbols of pigeon towers, By Chardin and Daolafu[4]

Pigeon towers dates:-

These kinds of buildings increasingly appeared during the Safavid period (1502-1736 AD). However, historians of the sixth and seventh centuries refer to the existence of this building in Isfahan[5], so that some of them even talk about this kind of building in fourth century[6] in poetry and literature books. In the 19th century A.D., travelers calculated the numbers of Kapotar houses around Isfahan and found about 3000 units[7] . It is difficult to find a date or inscription on the tower building, or an accurate date in the historian or travelers text; so it is mainly an estimation of approximate dating. According to Chardin, only Muslims could build these towers; for they do nothing except paying the tax on the manure[8]. In the early nineteenth century, the revenue from a tower was calculated with around 100 Tomans per annum[9].Safavid era and the rules and regulations on the ownership and the role of religion in the most exclusive construction and operation of Isfahan the dovecote are referred to the Shiites. Also "all those who are interested in having dovecote with the exception of resident who are not religious can make an official state religion and in this case there is no requirement of exclusivity and privilege. Just pay the tax manure" [10]

Pigeon towers function:-

Local Persian pigeon are about 200 kinds[11]. Pigeon towers are, in general, typical examples of rural architecture of the index and it's based on the local needs of rural vernacular architecture. Pigeon towers of Isfahan and its surrounding give some examples of a sound approach for the needs of humanity and nature in the rural architecture (Pics.1-2-3) fig. (1).

Persian farmers built pigeon towers to attract Persian wild pigeons[12] whose dung they harvested each year to fertilize melon fields[13], for the Iranian farmers had a problem that the soil of their lands around Isfahan lacked adequate nitrogen. To solve this problem, farmers developed the ingenious pigeon towers[14]. They also use the pigeons to soften the leather in Isfahan's famed tanneries[15]. Despite the good taste of the Iranian doves, it is

[4]) Chardin, Voyages de chevalier Cahrdin en Perse et autres lieus de l'Orient, vol. III,Paris,1811,p. 382. Madam Daolafu," Iran, Kolda va Shoush", transelated by Mohamed Farwsheh, Tehran University press,p.308

[5]) Ibn-Battuta, " the travels of Ibn Battuta", Beirut, 1987, p. 265

[6])el- Qalqashandi, "Subh el A'asha fi sena'at el encha", Dar el kotob el Misrya, Cairo, 1922, vol.6,354. El-Narshakhy, Abu Bakr "Bukhara history", Dar el ma'aref, third edition, p.287

[7]) Chardin, Voyages de chevalier Cahrdin en Perse et autres lieus de l'Orient, p. 383

8)Chardin, Voyages de chevalier Chardin en Perse et autres lieus de l'Orient, vol. III,Paris,1811,pp.385-387

9) Elisabeth Beazley, "the pigeon towers of Isfahan, Iran", Journal of the British institute of Persian studies, vol. IV, 1966, p. 107.

[10]) Beighami, Ghahari,Hoiiat, " looking at the types of pigeon houses remaining in Isfahan and revival opportunities in these buildings", Cumhuriyet University faculty of Science, Science Journal, Vol.36, No.4, special Issue 2015, pp.1402-1411. P. 1403

[11]) Encyclopedia Iranica, 2012

[12]) Pigeons and doves are stout-bodied birds with short necks and short slender bills.
There are 308 species worldwide and 9 species in Iran. The most popular is1- Rock (messenger) pigeon Columba livia , 2-Stock pigeon Columba oenas, 3- Pale-backed pigeon Columba eversmanni, 4-Common wood-pigeon Columba palumbus, Pigeons and Doves of Iran*."* Wikipedia. Available at http://en.wikipedia.org/wiki/List_of_birds_of_Iran

[13]) Aryan Amirkahni, Parham Baghaie, Ali Akbar Taghvaee, et al: *"*Isfahan's dovecotes: remarkable edifices of Iranian vernacular architecture*."* METU JFA, June 16, 2009, Volume 26, Number 1, pp. 177-186

[14]) Adam Olearius: The Travels of Olearius in Seventeenth-Century Persia. Stanford University Press, 1967

[15]) Aryan Amirkahni, Parham Baghaie, Ali Akbar Taghvaee, (2009), p.

known that the towers were never to be used for providing pigeon meat[16], which reflects a fact of long standing tradition of sacredness surrounding this particular bird[17]. The largest pigeon towers could house up to 14,000 birds. They are often over six stores high, of about 45 to 75 feet or 10 till 20 meter and in diameter they are approximately 5 till 10 meters. There are about two kinds of pigeon towers in Isfahan, the first located at the city border, thus, could play the role of fortress, the second is located next to the houses, and is smaller than the one located outside the city.

Picture (2): Symbols of pigeon towers, Hezar Jrip Kapotar Kahn

Picture (3): Symbols of Pigeon Towers around Iran, Isfahan and Yazd

Pigeon towers materials:-

The towers are made of unbaked mud; brick plastered with mud and can be as tall as 60 feet. Timber was seldom used[18].

Pigeon towers plan:-

By observation it can be said that pigeon towers have three types:
First: cylindrical plan type, which is a type that spread in Isfahan, Gourt, Shahr Reza, Najaf Abad, Qahderijan, Khaminey Shahr. The inner drum dimension is 1/2 to 1/5; the height is 11 to 16m. Diameter is between 8 to 15m. Outer drum could be slanted, containing between 2 or 3 floors[19] .

[16])Morier, a second journey through Persia, Armenia and Asia Minor to Constantinople between the year 1810 and 1816, London,1818,pp.140-141.
Jane Dieulafoy, La perse, La Chaldee et la susiane, Paris, 1887, pp.285-286
Curzon, Persia and the Persian question, vol.II, 1892,P.19
Thomas Herbert, Travels in Persia,1627-1629, Broadway travelers edition, London, 1928, p. 120
[17]) Elisabeth Beazley, the pigeon towers of Isfahan, Journal of the British institute of Persian studies, vol. IV, 1966, p. 108. For more information see Angelo de Gubernatis, Zoological mythology, 2 vol., London, 1872
[18])Elisabeth Beazley, the pigeon towers of Isfahan, Journal of the British institute of Persian studies, vol. IV, 1966, p. 105.
Aryan Amirkahni, Parham Baghaie, Ali Akbar Taghvaee, (2009),p.
[19])Nabi, Dayrosh, "Kapotar khan Isfahan", second congers of the history of Iranian architecture and urbanism, sazman mirth farhangy,1378, pp.201-223.p. 207

Second: cubic plan type, which exists more in Khunsar, Gulpayagan and khamyen, with height of 12 to 17m., and width of 4 to 8[20].

Third: polygon plan type. The plan could contain 4, 8, 10, 12 sides, in which the diameter of each side is about 2,5m. The height is about 10m. Nevertheless, the dimension of these types is more complicated to calculate than the other previous types[21].

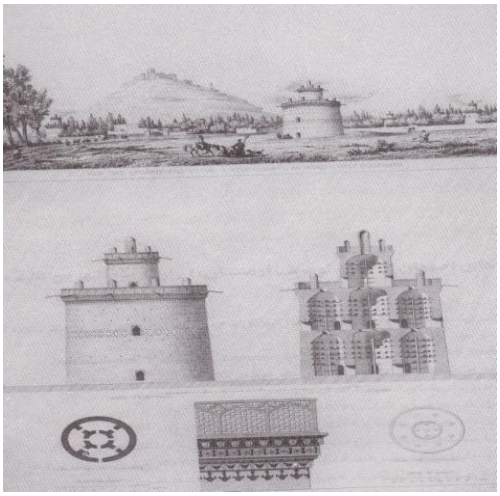


Fig. (1): Section, elevation, and plan of a pigeon tower, By Pascal Coast.

Generally, a wooden timber used to build pigeon towers structures by the entire structure to have the ability to withstand axial forces, Domes and arches are mostly used for structural applications, and the structure has been designed in such a way that the arrival of pigeons and snakes could be enter, to eliminate snakes entry, in the external façade, material are washed plaster and straw colorless to red was used, But if, instead of a thin layer of thatch, the snake could take advantage of surface rough thatch of friction emerged that access to the top of the towers. In addition, architects used the polish and washed plaster to prevent snakes through measure such as the use of rows of brick, brick frames. These cases which are the final layer of plaster were used to wash in the plaster on which they were implemented[22].ach tower essentially consists of an inner and outer drum; the outer drum could be lobed. Sometimes the inner drum plan is different from the outer, and that is according to the total plan of the pigeon tower.

Picture (4): Remains of one of the pigeon tower, shows the inner and outer tower's drums

The inner and outer drums are connected by open arches at every level. The pigeons enter only through the domes cupolas or "pepper-pots" with holes in lateral walls, not from honeycomb brickwork. Pic (4)

[20]) Nabi, Dayrosh, "Kapotar khan Isfahan", pp. 207-209
[21]) Nabi, Dayrosh, "Kapotar khan Isfahan", pp. 209-210
[22]) Beighami, Ghahari,Hoiiat, " looking at the types of pigeon houses remaining in Isfahan and revival opportunities in these buildings"p.1405

Picture (5): symbol of Honeycomb and its structure

The thousands of stoops inside the tower are arranged so that all the droppings go to the floor, making them easy to collect. For that, it is arranged in a geometric method (Pic. 5-6), Figure (2) the structure of the pigeon holes measure 20 x 20 x 27 cm. above mud perches, and sometimes reach 30 x25 x20 cm.[23]. Each honeycomb is of an unequal side pyramid whose square base is clapped.

Pigeon tower structures allow pigeons to roost, loaf, and nest in the building.

Picture (6): symbol of inner pigeon towers' structure

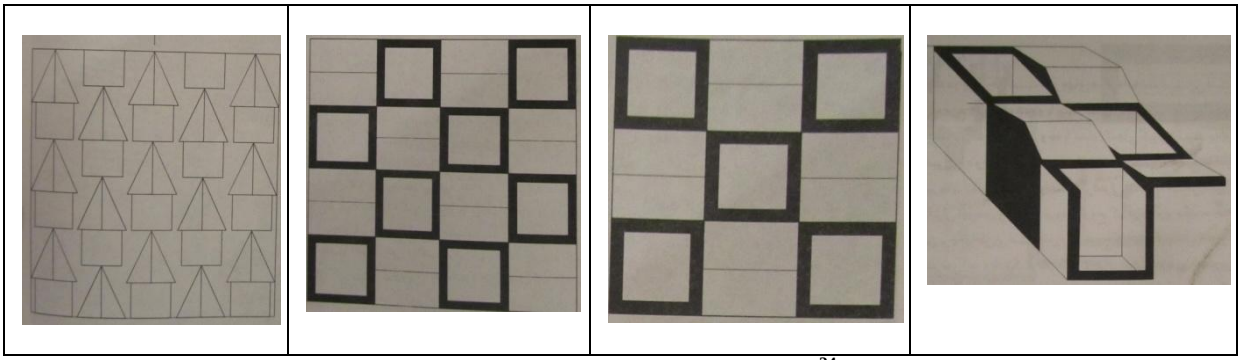
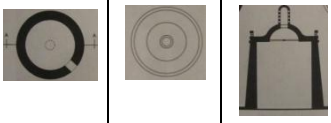
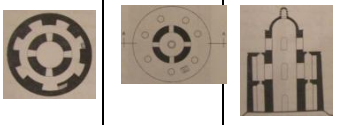


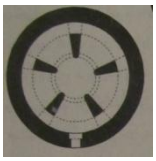
Figure (2): section of the honeycomb[24]

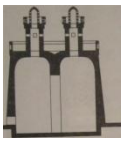
[23]) Mohamed Mahmoudian, Ali Chit-Saz, "Pigeon houses of Esfahan",Kolha, Esfahan,2000, p.58
[24])Mahmoudian, Ali Chit-Saz, "Pigeon houses of Esfahan",pp.208-209

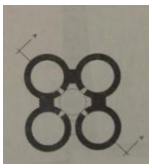
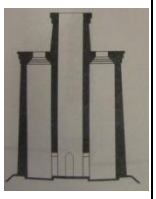
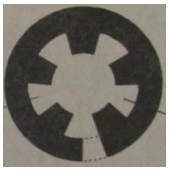
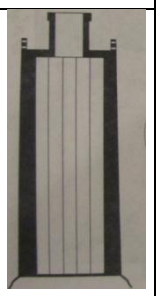
Survey of Isfahan's pigeon towers[25]

Kapotar's name	Date	Location	Description
Ardal	Safifed-Qajari	Flower-jan village	First type: Cylindrical plan, poor in decoration, roofed by semi circle. Dimension 7,30m. Height is 10m. (Fig.) 
Sirgar Souq Rahnan	Safifed - Qajari	North–east Isfahan	Third type: Planned by two scales, the inner plan is pentagon; the outer one is cylindrical, roofed by dome with lantern. The outer diameter is 11,40m. Its height is 18.40m.
Sirkah endaz	Safifed - Qajari	Rahnan	First type: Planned by three scales, all of them are cylindrical, connected by a small corridor, from the ground to the first by two narrow corridor, and from the first to the second by four narrow corridors. They are 13,20m in diameter, and 19,20m in height. 

[25]) used the compatible information and plans from "Pigeon houses of Esfahan" pp. 76-212

Eskalon	Safifed-Qajari	North-east Isfahan	First type: Planned by four scales, all of them are cylindrical, connected by small corridors, from the ground to the first by three narrow corridors, while from the first to the second by nine narrow corridors; 15m. in diameter, and 20m. in height    
Radan	Safifed - Qajari	South-east Isfahan	First type: Planned by three scales, all of them are cylindrical, connected by five small corridors, 14.30m in diameter, and 19m.in height  
Hezar jrip	Safifed - Qajari	Isfahan	First type: Very unique plan, consisting of three scales; the first and the second are cylindrical, the third planned like a rose with eight petals, the first connected with the second by four small corridors, and the second connected to the third by eight small corridors.

					
Aqa golam-Ali	Safifed - Qajari	Najaf-Abad	Second first: Rectangle plan with two cylindrical columns inside the rectangle plan.		
					
					

Largan/ Largon	Safifed-Qajari	Flower-jan	First type: Cylindrical in the middle, surrounded by four circle columns, with the diameter of each column 1.90m. The diameter of the whole tower is 7.30m.; its height is 10.80m. Some Shia'a inscriptions are found on the outer column.
			 
Qala Shah	Safifed-Qajari	Najaf Abad	First type: Cylindrical plan, with 5.30 diameter and 14m in height
			 
Kaknan	Qajari-Pahlavi	Marbin , Rural district	First type: Circular plan, with 13,53m. in diameter, and 9.40 height
Asiya-abad	Qajari-Pahlavi	South of flower-jan, village of Asiya-abad	First type: Cylindrical lobed plan, consisting of fourteen column.
Ismail Tarkhan	Qajari-Pahlavi	South of Isfahan	First type: Two circular plans.
Oshtorja	Qajari-	Oshtorj	First type: Two circular plans,

n	Pahlavi	an village	of 13,85m diameter.
Baq-Malek	Qajari-Pahlavi	Baq-Malek village	First type: Cylindrical lobed plan.
Xulenjan	Qajari-Pahlavi	Xulenjan village	First type: Cylindrical lobed plan.
Barze	Qajari-Pahlavi	Dirgha village	First type: Circular plan, 17.5m.diameter, 14.5m height
Dinan	Qajari-Pahlavi	Khomeini Shahr	First type: Two circular plans.
Riz	Qajari-Pahlavi	Zarine Shahr	First type: Two circular plans.
Sahlavan	Qajari-Pahlavi	South of flower-jan village	First type: Cylindrical lobed plan.
Siah bom	Qajari-Pahlavi	West of Mobaraka	First type: Cylindrical lobed plan.
Shams-abad	Qajari-Pahlavi	Isfahan	First type: Two circular plans, with 18.30m diameter.
Karkevand	Qajari-Pahlavi	South-west Mobaraka	First type: Cylindrical lobed plan.
Koshageh	Qajari-Pahlavi	South of Flower-jan	First type: Cylindrical lobed plan.
Mohamed Khan	Qajari-Pahlavi	South of Flower-jan	First type: Two circular plan.

The planning source:

Architects and archeologists have two visions of the planning sources of pigeon towers. Some of them state that the planning source could relate to the Armenian architecture that came to Isfahan at the time of Shah Abbas I (1587-1629), but by studying this suggestion from the historical perspective we can affirmatively deny it, because of the existence of the pigeon towers since the 4th A.H. /10th A.D. century [26].

[26]) Elisabeth Beazley, the pigeon towers of Isfahan, Journal of the British institute of Persian studies, vol. IV, 1966, p. 105.

Others mention that the planning was inverted from ***Ātaškada*** [27] ***"fire temple"*** and that because some fire houses were reused as pigeon towers after being neglected. To trace the difference between the plans of the pigeon towers and the fire temples, reference will be made to the general plan of the fire temple. The characteristic feature of the Sasanian ātaškada was that it was a domed sanctuary or gombad in which the fire itself was established. This had a square ground-plan and four corner-pillars which supported the dome (the gombad proper) on squinches. On a number of sites, the gombad was usually made of rubble masonry with courses of stone, which all survived, while the ruins are popularly called in Fārs the čahār-ṭāq or "four arches". Archeological traces and literary evidence suggest that the gombad was regularly surrounded by a passage-way or ambulatory, to be presumably used by both the priests who tended the fire, and the worshippers. A typical small ātaškada appears to have consisted of the fire-sanctuary itself, with a passage-way; a smaller room or rooms for storing fire-wood, incense and utensils; and a yazišn-gāh or "place of worship" where the priest or priests would celebrate the rituals of faith. These were never performed within the Gombad, where no ventilation might be offered except directly to the fire itself. There are also, at some sites, traces of a large hall[28]; its material was backed brick and stone.

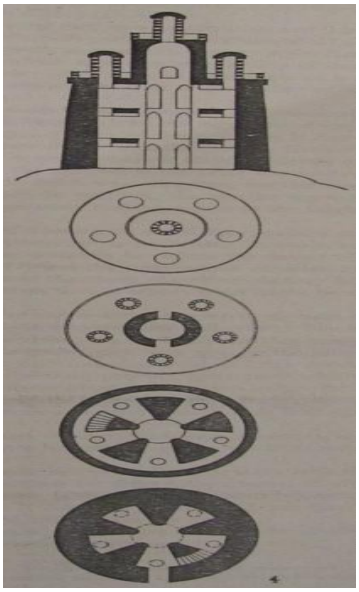


Figure (3): Plan and section of Ateshg □h at Isfahan[29]

By tracing the fire temple plan and its function, it is easy to say that the open arches, or open flat arches on the dome were used for showing the flame of the fire to the people which cannot enter the sanctuary room of the fire.

The main features of pigeon towers:

- Pigeon towers are vernacular buildings like the military tower and minaret. As in all traditional vernacular buildings, which are featured by plain decorations, it is hard to definitively date them.
- The idea of having towers in Iran is widely spread, for we noticed a huge number of towers in many cities resembling the minaret planning, like Dota Dar El Deifa and Gonbad tower in Isfahan etc., which means that they adopted the vernacular building as a shape due to their architectural heritage, for in the main time, it was a successful plan in usage.
- The Pigeon tower was plain, poor in decoration, even as regards to the construction inscription.

[27]) "house of fire," a Zoroastrian term for a consecrated building in which there is an ever-burning sacred fire. M. Boyce, Encyclopedia Iranica, Vol. III, Fasc. 1, pp. 9-10, 1987

[28]) A. Godard, "Les monuments du feu," Āthār-é Īrān 3, 1938, p. 12. M. Boyce," Encyclopedia Iranica", Vol. III, Fasc. 1, pp. 9-10, 1987

[29]) Beazley, the pigeon towers of Isfahan, p.107

- Almost all the towers are circular and relatively separate from their neighbors in the fields. Rarely one finds rectangular towers reminiscent of small forts, as in the Khunsar-Gulpayagan area to the north-west of Isfahan.
- Difference in type of the towers is related to the difference in climate between the north which use the cubic type, and the centre of Isfahan which use the cylindrical type.

- The towers are also a distinguished example of architectural theme and variation; each based on one of eight traditional forms, but unique in its particular architecture.
- Each design has a unique meaning, which makes it difficult to relate the design of pigeon towers to represent the civil building replacing the fire houses which are religious buildings, due to the difference in the purpose and the function of both buildings.
- It is designed to have no entrance below the roof level. This was certainly deliberate to reduce the danger of snakes**.**
- Although the Iranian architecture use much timbers, pigeon towers did not make use of timber, for the Iran plateau was always designed to face earthquakes.
- It is quite obvious that the usage of the pigeon tower was mainly as a source of many beautiful gardens built in and around Isfahan, which were unprecedented around the world.

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