

12 Enlarged-based arrow-loops in the Near East (twelfth–fourteenth century) defence or ostentation?

Maxime Goepp and Jean Mesqui

Version non définitive

<09/02/2023>

Foreword¹

Arrow-loops were a basic feature of defensive architecture in the medieval period. In the Near East, they were well known in the Byzantine fortification, and are common in medieval fortresses and urban defences, both Crusader and Muslim. Nevertheless, arrow-loops with enlarged bases, of triangular, semi-circular or rectangular shape, appear only in the Crusader kingdom and principalities, as well as in the Armenian kingdom in Cilicia, in contrast with the kingdoms of France and England where they are common. This chapter will suggest a typology of these features. It will also examine their distribution around the Eastern Mediterranean, their dating and their relationships with other arrow-loops; particularly those in the French and Anglo-Norman kingdoms. It will propose that the enlarged bases originated in Europe, where it can be firmly dated to the years around 1200. The discussion will tackle the difficult question of the functionality of these features vs. their ostentatious role.

The most important requirement of such an exercise is to build a complete inventory of these devices. The two authors have visited, during the last 30 years, all survived medieval fortifications throughout the Mediterranean (not just for this study!). In addition, Maxime Goepp has discovered several previously unknown sites in the region, particularly in Cilicia, and carefully noted and photographed arrow-loops wherever they were present. The preliminary elements of this enquiry have been published by the authors²; the present chapter will give us a more in-depth approach, with an extensive bibliography. A map (Figure II.12.1) and a table of the fortified sites (Table I at the end of the chapter) summarize the results.

1 Our special and warm thanks to Neil Ludlow, prominent British expert in medieval fortified architecture, Castle Studies Group's fellow member, who has accepted to edit the present chapter, and helped to improve both the form and the substance.

2 Maxime Goepp, "Les archères à étriers dans l'Orient des croisades," *Histoire et images médiévales* 20 (february-april 2010), 42–49; Jean Mesqui and Maxime Goepp, *Le Crac des chevaliers (Syrie). Histoire et Architecture* (Paris, 2019), 414–415.

TABLE II.12.1 Table of the fortifications presenting enlarged-based arrow-loops in the Middle East (© Maxime Goepf). ▲: Perfect triangular bases. △: Approximated triangular bases. ∩: Semi-circular bases. ∩: Oar-shaped bases. □: Rectangular-shaped (spade) bases. ⚓: Steep plunging sill. ⚓: Small plunging base. □: High sill (arm-rest) (© Maxime Goepf). ?: Unknown.

Military Order	Site	Location	Fishtail	Stirrup	Oar / Spade	Plunge	High sill
Kingdom of Jerusalem							
T	<i>Chastel Pelerin</i> / Atlit	Castle, southern front			∩	?	?
Teu	<i>Montfort</i> /Qal'at al Qurain	Upper Castle (primitive enclosure) Gateway	▲	∩		?	?
		External enclosure (north, north-west)		∩		⚓	?
T	<i>Beaufort</i> /Qal'at al Shaqif Amoun	Castle (south-west)	△	∩		?	?
	<i>Cesarie</i> /Caesarea/Qesarya	Urban enclosure (tower 11)			∩	⚓	-
T	<i>Sidon</i> /Saida	Sea Castle (north west)		∩	∩	⚓	□
	<i>Smar Jbeil</i>	Castle (south wall, barbican)	△	∩		?	-
H/T	<i>Recordane</i> /Khirbet Kurdana/Tel Afeq	Keep				?	-
H/T	<i>Caco</i> /Qaqun/Yikon	Keep	▲			⚓	□
County of Tripoli							
	<i>Beaude</i> /Balda/ Arab al Muluk	Castle		∩		?	?
H	<i>Crac des chevaliers</i> /Qal'at al Hosn	Reused in Mamluk tower 43 (south) External enclosure (west), "Barbican of Brother Nicolas Lorgne" External enclosure (north-east, south-east) External enclosure (eastern ramp) External enclosure (south east)	▲ △ △ △	∩ ∩ ∩ ∩		⚓ ⚓ ⚓ ⚓	? □- - -
H	<i>Margat</i> /Qal'at al Marqab	Castle (outer wall and north-east round tower) Urban enclosure (walls and western gateway)	△ △	∩		?	-
T	<i>Tortose</i> /Tartous	Inner enclosure			∩	⚓	□
Armenian Kingdom in Cilicia							
	Anahça	Castle	△			?	?
	Anavarza	Castle lower enclosure (south east tower) Castle northern enclosure (northern tower)	▲ ▲			?	-
	Bakaçak	Castle	▲			?	?
	Belenkeşlik	Keep	△			?	-
	Böğrüeğri	Castle	△	∩		?	?
	Çardak	Castle (south)	△	∩		?	?
	Çökak	Keep	△			?	-
	Eimali	Fortified church	△			?	-
	Fındıklıman	Castle	▲			?	?
	Güveleşli/Gökvelioğlu	Castle	△			?	?
Teu	<i>Haruniye</i> /Harun Reşit Kalesi	Castle		∩		⚓	□
	Heblil	Keep	△			?	?
	Kız (near Dorak)	Keep	▲			?	-
	Kız Kalesi (near Korykos)	Castle	▲			?	-
	<i>Corycus</i> /Korykos	External enclosure (north, east)	△			?	-
	Sis/Kozan	Castle (eastern enclosure, barbican) Castle (southern upper tower)	△ ▲			?	- ?
	Kuzuçubelen	Keep		∩		?	-
	Mancılık	Castle	△			?	-
	Meydan	Castle	▲			?	-
H	Silfke	Castle, lower and upper enclosure	▲			?	-
	Sinap (near Candir)	Keep		∩		?	-
	<i>Skewra</i> /Sinap (near Namrun)	Keep	△			?	-
	Tece	Keep		∩		⚓	□
	Ti/Toprakkale	Upper castle (west) Lower enclosure (south, east)	▲ ▲	∩		⚓	□
	Tumlu	Castle	△			?	-
	<i>Ayas</i> /Yumurtalık	Urban enclosure	▲			?	?
Kingdom of Cyprus							
	Bellapais	Enclosure (gate tower)		∩		-	-
H	<i>Famagouste</i>	Urban enclosure Castle	△	∩		?	□
	Kanlana	Castle	△	∩		?	?
	<i>Cetines</i> /Kyrenia	Castle	△	∩		?	?
T	<i>Limassol</i>	Fortified church	△	∩		?	?
H	<i>Paphos</i>	Keep	△			?	?
County of Achaie (Greece)							
	<i>Modon</i> /Metron	Urban enclosure		∩		?	?

Proof



Figure II.12.1 Map of the fortifications presenting enlarged-based arrow-loops in the Middle East. © Maxime Goepp

Proof

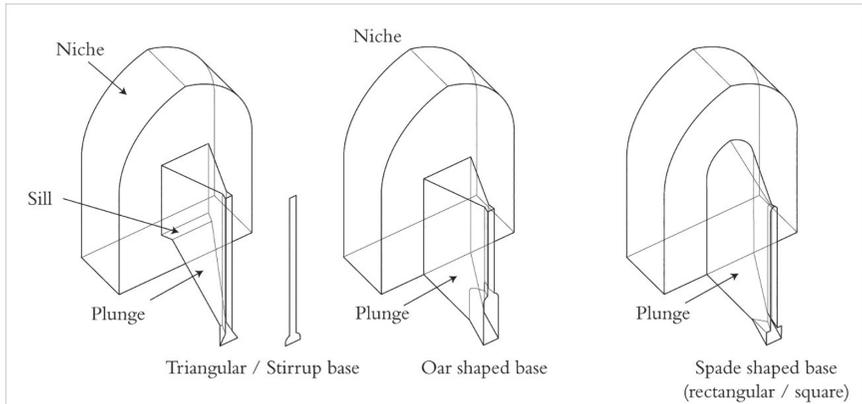


Figure II.12.2 Models of arrow-loops embrasures (all theoretical). © Jean Mesqui

As no universal glossary for such devices exists, we had first to define a terminology used in the present chapter. Table II.12.1 shows the terms used in France³ and in Britain (GB),⁴ which are the Western countries where enlarged bases are the most frequent (Figure II.12.2 and Table II.12.1).

<i>Geometric type</i>	<i>GB</i>	<i>FRANCE</i>	<i>Present chapter</i>
Generic	basal oillet	étrier (Eng. stirrup)	enlarged base
Triangular	triangular/fishtail basal oillet	étrier triangulaire	triangular/fishtail base
Square	square basal oillet	étrier en bêche (Eng. spade)	square/spade base
Elongated rectangular	rectangular basal oillet	étrier en rame (Eng. oar)	rectangular/oar base
Semi-circular/elongated semi-circular	stirrup basal oillet	étrier semi-circulaire	stirrup base
Circular	circular oillet	étrier circulaire	circular base/oillet

Both existing terminologies have their flaws. The term “oillet”, used in English, suggests a circular shape to French speakers, even though it is now used in a more generic sense by specialists. On the other side, the word “étrier” (stirrup), used in French, suggests to English speakers a shape with a flat base and rounded sides, a “curved” triangle so to speak. We will stick here to “enlarged base” as

3 Jean Mesqui, *Châteaux forts et fortifications en France* (Paris, 1997), 24–27.

4 Sidney Toy, *The Castles of Great Britain*, 4th ed. (London, 1966), 152–154, does not use any specific term to designate the enlarged bases. Neil Ludlow helped us find the right expressions in English.

a generic term and use either geometry or analogy to describe individual shapes (see Table II.12.1).

The Kingdom of Jerusalem and the County of Tripoli

Enlarged-based arrow-loops are unknown in Crusader fortifications until the end of the twelfth century. To get a better idea of their appearance, we will look at the castle of *Margat/Qal'at al-Marqab* (Syria), acquired by the Hospitallers in 1186 and rebuilt shortly afterwards in several phases. The arrow-loops in the first constructions attributed to the brethren do not show enlarged bases; neither does the massive keep, built shortly before 1202.⁵ In contrast, the second round tower of the castle (to the north-east), known to belong to the same campaign as the keep, exhibits large slits at the first floor, one of them with a triangular base, the other with a short stirrup base. In the same sector, the terrace and parapet of the outer enclosure show long slits with stirrup bases. When turning clockwise around the urban enclosure, one can see that stirrups appear only in the towers and battlements of the east side. Finally, the massive gate tower keeps two types of bases: they are triangular in the tower itself, whereas in the heightened section of the adjoining curtain, to the north, they resemble flattened curved stirrups. As there is no firm evidence for the duration of the works, one can only draw from this picture a fragile conjecture: enlarged bases could have been introduced progressively from the first decade of the thirteenth century onwards.⁶

Spectacularly large arrow-loops are to be seen at *Chastel Pèlerin*/⁶Atlit (Israel), in the south wall of the fortress, built by the Templars after 1218, where remarkably they take the form of a wine bottle⁷ (Figure II.12.4:1). They certainly belong to the first phase of the building in 1218, in which Walter of Avesnes, husband of the heiress of the county of Blois (France), played an important part. They appear to belong to the crenellated parapet of a wall around 10 m high and were blocked when the wall was heightened, and a vault built behind.⁸ This type of arrow-loop,

5 Balász Major, "Construction a Medieval Fortification in Syria: Margat between 1187 and 1285," *Bridge of Civilizations. The Near East and Europe c. 1100–1300*, eds. P. Edbury, D. Pringle and B. Major (Archaeopress, 2019), 1–22.

6 In the absence of very recent publications of the urban walls, see Paul Deschamps, *Les Châteaux des Croisés en Terre Sainte*, vol. III, *La défense du comté de Tripoli et de la principauté d'Antioche* (Paris, 1973), 259–286. Jean Mesqui, "Quatre châteaux des Hospitaliers (Crac des Chevaliers, Marqab, Qal'at Yahmur, Coleiath)," *Châteaux du Moyen Âge au Proche-Orient*, accessed 30/12/2022 <<http://www.castellorient.fr/0-Accueil/indexfran.htm>>

7 J. M. warmly thanks the Israeli army and his friend and colleague Vardit Shotten-Hallel, director of the conservation project at 'Atlit, for having allowed and organized a private visit (without photographs, unfortunately, due to the military occupation). The arrow-loops are described and drawn in C. N. Johns, *Guide to 'Atlit* (Jerusalem, 1947), 51–52, fig. 15.

8 J. M. could check onsite that the drawings of C. N. Johns are scrupulously realized, but fig. 15 C, which represents the Western extremity of the wall. Old photographs allow us to recognize, as Johns depicts it, the primitive crenellated parapet (blocked), but the upper part of the arrow-loops is in reality shorter than it is shown on the drawing. They were the same size as the line of arrow-loops in the rest of the western wall.

Proof



Figure II.12.3 Synoptic view of different enlarged bases. © Maxime Goepp

therefore, was in use at ‘Atlit only for a short period. The only other example of an arrow-loop with a similar base is a long way from ‘Atlit, in the *Tour du Foix* at Blois⁹ (Figure II.12.4:6); their presence in ‘Atlit cannot be considered as a coincidence, since Walter of Avesnes became count of Blois in the very year 1218.

9 Frédéric Lesueur, “Les fouilles du château de Blois, en 1906,” *Bulletin Monumental* 72 (1908), 78–119. <https://doi.org/10.3406/bulmo.1908.11440>, at 86–92.

Proof

Proof

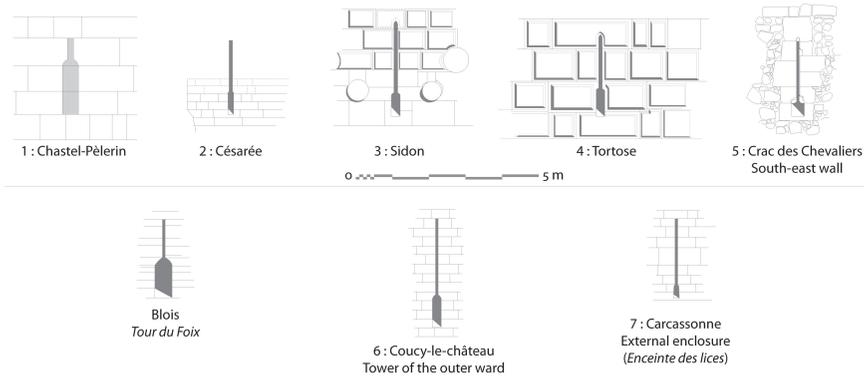


Figure II.12.4 Comparison of different oar-shaped arrow-loops in the Middle East and in France. © Jean Mesqui

Montfort/Qal'at al Qurain (Israel) was built by the Teutonic knights after 1228 and shows different types of enlarged bases. In the inner ward, the western wall of the original enclosure shows two perfect fishtail bases at the top (without their slits), which might be *in situ*: they were later blocked by the vaults of the hall adjoining the primitive enclosure to the west, and the slits disappeared.¹⁰ In the gate tower leading to the outer ward, to the north, are two arrow-loops at the first-floor level and the summit level (incomplete), with relatively large slits, and short stirrup bases. Finally, the finest stirrup bases appear in the walls of the outer ward, in the earliest as well as in the latest parts, which might have been unfinished in 1271; they are very close to the ground.¹¹

Crac des chevaliers/Qal'at al Hosn (Syria) was acquired by the Hospitallers in 1142. In the primary works (after 1170) arrow-loops were confined in the crenellated parapets, today heavily destroyed. A small triangular fishtail base has been reused in the round Mamluk tower 43 to the south; no other base of such a small size is visible in the castle. On the contrary, the entire outer wall enclosing the west bailey,

10 Mentioned in Adrian J. Boas, “Renewed Research at Montfort Castle,” in *Archaeology and Architecture of the Military. Orders*, ed. Mathias Piana (Farnham-Burlington, 2014), 175–192, at 186–188. Daniel Burger, Thomas Biller and Timm Radt, *Montfort und der frühe Burgenbau des Deutschen Ordens* (Petersberg, 2015), 93. Adrian J. Boas and Rabei Khamisy, *Montfort. History, Early Research and Recent Studies of the Principal Fortress of the Teutonic Order in the Latin East* (Leiden-Boston, 2017), 97.

11 M. G. recognized those in 2009 and published them in “Les archères à étriers . . .,” 45. The two parts of the walls are summarily described by Boas and Khamisy, *Montfort . . .*, 99–101. Description and photographs of the walls and of a stirrup-based arrow-loop in Burger, Biller and Radt, *Montfort*, 108–114, but the authors write erroneously that the arrow-loops of the north wall (the earliest) lack stirrups, which is not the case.

known as the “Barbican of Brother Nicolas Lorgne”, which is flanked by five round towers and a single rectangular one, was pierced by long and narrow arrow-loops with fine enlarged bases. Starting from the south, the bases are triangular (fishtail bases), but quickly become true stirrups with rounded sides (Figure II.12.3:1); these rounded sides become progressively flattened towards the north end of the wall. The works can be dated to 1240–1250 at the earliest, 1250–1260 at the latest.¹² The outer casemated walls on the north-east and the south-east, as well as the outer wall on the east over the former access ramp, show arrow-loops with semi-circular stirrups; in the south galleries, one can also see square spade-shaped bases, especially in the crenellated parapets (Figure II.12.4:5). These works were undertaken during the last decade of the Hospitallers occupation (1260–7121).¹³

One of the towers in the urban enclosure of *Césarée*/Caesarea/Qesarya (Israel), built in 1251–1252 by Louis IX of France, shows oar-shaped bases at the bottom of its arrow-loops¹⁴ (Figure II.12.4:2); why this was not the case in any of the other towers is a question we will try to solve in the discussion. In the same city, the keep of the citadel presented a spade-shaped base, depicted in a report written by the engineer Gottfried Schumacher in 1888,¹⁵ but the exact positioning of it is unclear.

At *Beaufort*/Qal‘at Shaqif Arnoun (Lebanon), a single arrow-loop with a triangular stirrup, not very deeply cut, survives in the wall to the south-west close to the inner gate. A curved stirrup base, no longer visible (before the recent restoration), was seen by Paul Deschamps in the same wall, in the 1930s.¹⁶ The wall is attributed to the Templars after 1260.¹⁷

On the Mediterranean to the north-west, is the sea castle of *Sagette – Sidon*/Saïda (Lebanon). Its north and west sides are surrounded by a vaulted gallery, probably built by the Templars during the latest phase of construction (after 1274).¹⁸ In the external wall of the gallery, laid out in magnificent bossed masonry (rebuilt using anastylosis in 1949–1950), is a series of arrow-loops with oar-shaped bases at regular intervals; the embrasures have a high sill with a deep plunge (Figure II.12.4:3). The arrow-loops opened right at sea level, which in terms of defence would make their oar-shaped bases and plunges unnecessary. In addition, Kalayan’s article

12 Mesqui, *Le Crac des chevaliers* . . . , 192–215 (with the discussion of the dating 214–215).

13 *Ibid.*, 410, 412.

14 Jean Mesqui, *Césarée maritime, ville fortifiée du Proche-Orient* (Paris, 2014), 214.

15 Gottfried Schumacher, “Researches in the Plain North of Caesarea,” *Palestine Exploration Quarterly* 19 (1887), 78–90, 19 (1888), 134–136. See Mesqui, *Césarée maritime* . . . , 355.

16 Paul Deschamps, *Les Châteaux des Croisés en Terre-Sainte. II. La défense du royaume de Jérusalem* (Paris, 1939), 204, fig. 18.

17 Christian Corvisier, “Les campagnes de construction du château de Beaufort (Qal‘at as-Sharqif), une relecture,” in *La fortification au temps des Croisades*, eds. N. Faucherre, J. Mesqui and N. Prouteau (Rennes, 2004), 243–266, at 253. Jean Yasmine, “Le château de Beaufort (Qal‘at Chqif Arnoun). Nouveau relevé, nouvelle lecture,” *Burgen und Schlösser* 50/4 (2009), 233–241.

18 Haroutune Kalayan, “The Sea Castle of Sidon,” *Bulletin du Musée de Beyrouth* 26 (1973), 81–90. See also Jean Mesqui, “La fortification des Croisés au temps de Saint Louis au Proche-Orient,” *Bulletin Monumental* 164 (2006), 5–30, at 24–26.

includes a photograph showing a very fine half-circular stirrup cut into a block of bossed masonry, which was probably recovered from the sea, but its initial position in the wall is unknown; the stone is no longer to be seen on the site.

During the same period, the inner enclosure of *Tortose/Tartous* (Syria), headquarters of the Templars in the county of Tripoli, which was originally 12 m high, was heightened by an astonishing 8 m in a second phase, probably to tackle the dangers of raids by the Mamluk army after the taking of Crac des Chevaliers (1271). The earlier parapet was blocked, and two levels of vaulted galleries were built over it; at the same time, the wall was widened towards the interior in order to accommodate the galleries. Each of the galleries was equipped with a series of arrow-loops alternating with square windows; at the lower level, the arrow-loops were oar-shaped in the same manner as their contemporaries at Saïda (Figure II.12.4:4). Only a 30-m-long stretch of the heightened wall remains to the south-east of the enclosure.¹⁹

Not surprisingly, all these fortifications were the work of the Military Orders (apart from Caesarea, built by the King of France); in fact, the Orders were practically the only builders in the Crusader principalities during the thirteenth century. Other examples can be cited, like the quadrangular keep at *Caco/Qaqun/Yikon* (Israel; Hospitaller or Templar), where a small triangular stirrup can be seen²⁰; the medieval mill of *Recordane/Khirbat Kurdana/Tel Afeq* (Israel; Hospitaller), where a square tower shows five loops with stirrup bases²¹; the ruined tower of *Beaude/Balda/Arab al-Mulk* (Syria; Hospitaller), with a fine semi-circular stirrup in the first (and last) visible course of stones.²²

As an exception, a small castle to the north-east of Saïda, *Smar Jbeil* (Lebanon), is totally unknown in the Crusader sources. The core of the castle comprises a fine rectangular keep and an enclosure flanked by square towers built bossed ashlar, probably from the mid-twelfth century. The south wall was partially rebuilt in small rectangular blocks, while a barbican was added to the west and to the south. Several arrow-loops can be discerned in these different walls. Two of them show a stone, at the bottom of the slit, which is engraved with the design of a triangular

19 First notice of this disposition and arrow-loops in Mesqui, "La fortification des Croisés . . .," 26–27. Mathias Piana, "A Bulwark Never Conquered: The Fortifications of the Templar Citadel of Tortosa on the Syrian Coast," in *Archaeology and Architecture of the Military Orders*, ed. Mathias Piana (Farnham-Burlington, 2014), 133–171, at 142–143.

20 Denys Pringle, *The Red Tower* (British School of Archaeology in Jerusalem, 1986), 58–71 (with a detailed monography). *Secular Buildings in the Crusader Kingdom of Jerusalem. An Archaeological Gazetteer* (Cambridge, 1997), 83–84. Denys Pringle proposes a dating to the end of twelfth or early thirteenth century, based on comparisons with Crac des chevaliers, but the dating of Crac des chevaliers has been revised since; identity of the builder is unclear, since the lords of Caesarea were still juridically in charge in 1257, but the site was in the hands of both Hospitallers and Templars.

21 Pringle, *The Red Tower*, 60. *Secular Buildings* . . . , 63–64.

22 Balász Major, *Medieval Rural Settlements in the Syrian Coastal Region* (Oxford, 2015), 70–71, plates 32–43.

Proof

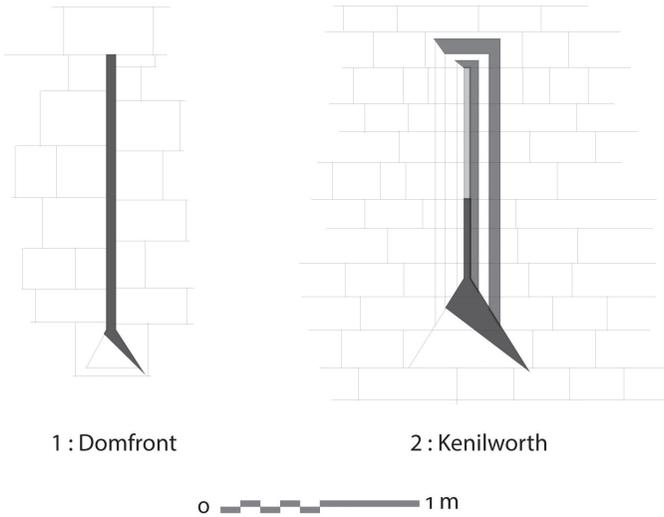


Figure II.12.5 Hypertrophic fishtail bases at Domfront (F) and Kenilworth (GB). © Jean Mesqui

stirrup, nearly flat, and which might be reused²³ (Figure II.12.6:3); there is no indication for either a date or an attribution.²⁴

To conclude on the Crusader principalities in the Levant, all the signs tend to converge on the following points:

- Enlarged bases appear probably as of the start of the second decade of the thirteenth century.
- Perfect fishtail bases are relatively rare and seem to be used more in the beginning than at the end of the thirteenth century.
- The most common shape is the stirrup, more or less flattened.
- From the mid-thirteenth century onwards, the design tends to become more sophisticated, with spade-shaped bases and (more frequently) oar-shaped bases. Nevertheless, as early as in the 1220s, 'Atlit uses very uncommon bases which were never used elsewhere.
- Enlarged bases are used in fortresses of all sizes and functions, from small towers to large garrison castles.

23 M. G. recognized those in 2008.

24 Anis Chaaya, "The Castle of Smar Jbeil. A Frankish Feudal Stronghold in Lebanon," *Journal of Eastern Mediterranean Archaeology and Heritage Studies* 4/2–3 (2016), 209–241, does not notice the stirrups and proposes a dating of the barbican to the second part of the twelfth century, which might be too early.

Proof

Proof



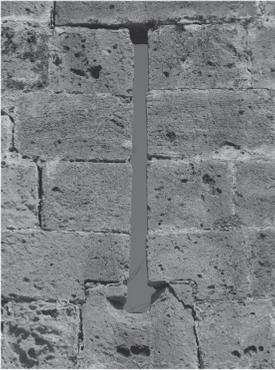
1. Korykos
Turkey, 2007



2. Gökvelioğlu
Turkey, 2007



3. Smar Jbeil
Lebanon, 2008



4. Bellapais
Cyprus, 2008



5. Sis
Turkey, 2015



6. Sis
Turkey, 2011



7. Böğrüeğri
Turkey, 2011



8. Kerak
Jordan, 2011



9. Rumkale
Turkey, 2007

Figure II.12.6 Arrow-loops for the show. Synoptic view of different cases. © Maxime Goepf

Proof

Armenian Kingdom in Cilicia²⁵

The picture is very different in the Armenian Kingdom in Cilicia. Robert W. Edwards's pioneering work conclusively demonstrated that, in the numerous Cilician fortifications, the enlarged-based arrow-loop is one of the criteria to recognize Armenian works from Byzantine or Mamluk constructions. This can be considered as perfectly true, but the lack of written or epigraphic sources is such that only a very few of these fortifications have an history which could help in dating their constructional phases and in outlining an evolution scheme. It has to be reminded that the Armenian Kingdom in Cilicia lasted till 1375, and from 1266 was under constant raids from the Mamluks; thus the fortifications which can be seen today are the result of many building campaigns, some of them very late.²⁶ Unfortunately, a large number of sites have, in the past years, undergone heavy restoration. Architectural (and archaeological?) evidence has been transformed and/or removed, without any internationally available record.

The huge fortress of *Sis/Kozan*, one of the most important since it was the capital of the kingdom, and siege of the *Kat'olikos*, shows well the complexity of the topic.²⁷ On a rocky mountain, several baileys surround the upper castle. Enlarged-base arrow-loops are mainly concentrated in the eastern bailey, in the sector of the main gate of the castle. The walls comprise a heterogenous set of towers and curtains, presenting different construction stages, the latest probably Mamluk. Different kinds of arrow-loop bases can be seen at the level of the former vaulted wall-walk, most of them with fishtail bases; none of them is documented, and some of them might belong to the fourteenth century or have been reused.²⁸ A large rounded salient (O in Edwards' plan) shows 2 m below the summit two fishtail bases, also without their slits, and one can recognize at the level of the wall-walk another fishtail base showing that the salient was heightened (Figure II.12.6:5).²⁹

A single Armenian inscription on a stone in the hall within the upper tower (tower M in Edwards' plan), records the name of King *Het'um* (probably *Het'um*

25 All sites mentioned here are located in Turkey. They were visited and photographed by Maxime Goepp; the descriptions and analysis are done by the two authors with the help of the considerable documentation accumulated by him. Obviously, the considerable work of Robert W. Edwards, *The Fortifications of Armenian Cilicia* (Washington, 1987) forms a solid basis; the cross-examination with Hansgerd Hellenkemper, *Burgen der Kreuzritterzeit in der Grafschaft Edessa und im Königreich Klein Armenien* (Bonn, 1976), is always useful. Unfortunately, more recent published works do not bring any new elements.

26 R. Edwards rarely enters discussions on sequences of construction or precise chronology in the fortifications. Unfortunately, this scientific and prudent attitude has allowed some of his followers to put forward conjectures in favour of early dating (sometimes very early!) without any kind of archaeological proof.

27 Edwards, *The Fortifications* . . . , 233–237.

28 The round tower of the south bailey shows very large rectangular bases dating from the late Mamluk or even early Ottoman period, since they are designed for firearms.

29 The same observation can be made in the small castle at Bakacak, whose west wall has also been heightened.

I, 1226–1270). This rounded tower is built on a solid square base where two perfect fishtail bases, minus their slit, are to be seen in the upper course (Figure II.12.6:4): another stone carved with a fishtail base carved inside was re-used, upside down, on another side of the tower. This shows obviously that a first square salient equipped with arrow-loops was infilled and heightened to accommodate the royal hall above.³⁰ The reuse of stones carved by arrow-slit bases was frequent (see, for example, Böğrüeğri, Figure II.12.6:7).

Also iconic, the fortress of Anavarza presents another picture. It had been the capital of the principality before the creation of the kingdom by Levon I (known before his coronation as prince Levon II) before the end of the twelfth century. Built on a large outcrop of limestone rising over the plain, the site consists of a large, nearly rectangular plateau, separated from the elongated upper castle to the north by the famous keep bearing an inscription to prince Levon II (1187). Several Armenian flanking towers survive in the lower enclosure and were obviously built in a single campaign; nevertheless, only one of them, on the corner to the south-east (tower D on Edwards' plan), shows arrow-loops with fishtail bases (Figure II.12.3:6). On the northernmost end of the upper castle, which is mostly Byzantine, is a rectangular tower of probable Armenian build, which exhibits a well-conserved arrow-loop, relatively large and wide, with a perfect triangular stirrup, between two *bretèches* (machicolations supported by two corbels). Nothing at all can be said on the phasing of these constructions, due to the lack of documentation.³¹

A statistical approach shows that, in 26 out of 29 cases present in the territory, the arrow-loops present fishtail bases, designed as perfect isosceles triangles (see, for example, Belenkeşlik, Figure II.12.3:5). This does not mean that they are all similar. One can find flattened triangles, like for instance at Anahşa³² (Figure II.12.3:8) and at Sis/Kozan (base of the round tower M); on the contrary, the triangles can be elongated, at Toprakkale, Kız Kalesi/Korykos, Sis and Silifke (see next). They can be very large, as in Fındıkpınarı³³ (Figure II.12.3:9); at Meydan³⁴ (Figure II.12.3:7) where there is a single very large example in an arrow-loop placed at ground level, whereas all the others are normal; and in the parapets of the north-east wall at Sis/Kozan. They can vary in depth: in some cases, the fish-tail is merely carved on the surface of the stone, like for instance in Çokak³⁵ and Mancılık,³⁶ ruling out any functional use.

30 Same observations at *Ayas/Yumurtalık*, *Elmalı* and *Böğrüeğri* (figure 6.7), where the only remaining fishtail bases are now re-used in the walls, sometimes upside down.

31 Edwards, *The Fortifications* . . . , 65–72. Hellenkemper, *Burgen*, 191–201.

32 Edwards, *The Fortifications*, 62–65.

33 *Ibid.*, 122–123.

34 *Ibid.*, 189–194.

35 Not mentioned by Edwards.

36 Edwards, *The Fortifications*, 185–187.

On the other hand, only a limited number of sites show true stirrup-based arrow-loops: where present, they are perfectly semi-circular. The small castle of *Haruniye*/Harun Reşit Kalesi was granted by King Het'um I and his wife Zapël (Isabella), on 22 January 1236, to the Teutonic Knights; we believe it was entirely rebuilt by the brethren, with a D-shaped tower probably containing a chapel.³⁷ The north wall is defended by 11 casemated arrow-loops, each of them with a perfect semi-circular base (Figure II.12.3:3), reminiscent of those in the outer bailey at *Montfort*/Qal'at al Qurain (Israel).

Another impressive castle, *T'il*/Toprakkale, also shows such arrow-loops. This huge fortress comprises a strong polygonal enclosure flanked by no less than 12 U-shaped towers, strengthened to the south, west and north by a concentric lower wall also flanked by several towers, and a strong lower bailey with polygonal towers. In the upper castle, the west wall shows a very interesting sequence of arrow-loops: referring to Edwards' plan, tower E (north-east) has a semi-circular stirrup; curtain G-E presents four arrow-loops with elongated triangular bases and vaulted embrasures with high sills and plunges, certainly contemporaneous, which can easily be distinguished from the arrow-loops of the curtain G-H, lacking enlarged bases and opening in Mamluk casemates. They are also very different from the arrow-loops of the concentric lower enclosure, which are equipped with large triangular bases, as at Fındıkpınarı and Meydan. The remarkable vaulted gallery running within the base of the impressive glacis to the east of the upper castle presents also a perfect stirrup-based arrow-loop (Figure II.12.3:2).

Thus, like Hellenkemper (and unlike Edwards), we think that these very specific arrow-loop bases were influenced by Crusader designs, and we suggest that nearby *Haruniye*/Harun Reşit Kalesi might be one source.³⁸ The same could be conjectured for the nearby garrison-fort of Çardak, which has no documentary record. Three casemated arrow-loops, with rounded stirrup bases, survive in its southern wall; the East tower (E on Edwards' plan) also shows triangular stirrup bases at summit level. Edwards suggested that the entire castle could be attributed to the Byzantines, but this dating is not acceptable, as the semi-circular stirrups are clearly of later construction.³⁹

Surprisingly, two other cases, not situated in the same area but more towards the west, show such arrow-loop bases: the two manorial towers of Sinap (close to Çandır), and Tece.⁴⁰ Nothing can be said about the history of these *maisons fortes*.

It is obviously not possible to give details on all the Cilician sites presenting enlarged bases. Nevertheless, it is worth evoking the case of Silifke, the

37 Ibid., 143–147, curiously seems to underestimate all the evidence and attributes the castle to the Armenian (“none of the architectural features in the garrison fort indicate that any significant German construction is present”). This is also true for Hellenkemper, *Burgen* . . . , 116–119. Obviously they did not know *Montfort*. See A. Boase, *Archaeology of He Military Orders* (Routledge, 2006), 146, who also considers the construction as Teutonic.

38 Hellenkemper, *Burgen* . . . , 140–153. Edwards, *The Fortifications* . . . , 244–253.

39 Edwards, *The Fortifications*, 110–111. Hellenkemper, *Burgen* . . . , 108–110, proposes the first half of the thirteenth century.

40 Sinap: Edwards, *The Fortifications*, 231. Tece: *ibid.*, 141–144.

westernmost castle on the Mediterranean coast, which is in some ways a counterpart of *Haruniye*/Harun Reşit Kalesi. This important Byzantine stronghold was granted to the Hospitallers in 1210, by King Levon I; 16 years later, the castle was relinquished by the brethren to the young widow Queen Zapēl and her new husband to be Het'um I.⁴¹ As Mathias Piana has shown,⁴² the major part of the walls and towers of the two concentric enclosures was probably built by the brethren immediately after 1210: all the arrow-loops were equipped with elongated triangular bases.

Very similar arrow-loops can be seen at both the land and the sea castles of Kız Kalesi/Korykos. The land castle is mostly of Byzantine build; but in the outer concentric enclosure on its north and east sides, which was constructed or repaired later, arrow-loops with elongated fishtail bases pierce the walls. The sea castle, while similarly of unquestionable Byzantine origin, was entirely rebuilt by the Armenians; two inscriptions in the south-east quadrangular tower celebrate King Levon I in the year 1206 and King Het'um I in the year 1251 for having built the castle anew.⁴³ Towers and walls of the fortress show arrow-loops with elongated fishtail-bases (some of them unfortunately badly restored in the south-east tower), clearly similar to the ones of Silifke (Figure II.12.6:1). It seems probable that the construction happened during Het'um I's reign.

To summarize, even if the sources are lacking, the general feeling is that the appearance and development of enlarged-based arrow-loops in Armenian Cilicia was coeval with the birth and growth of the Armenian Kingdom, i.e. from Levon I onwards (1197–1198), and probably even later, from Het'um I. The latter was the first king to unite the two rival Houses of the Rubenids and Hetumids, and thus the first king with real power over the whole territory.

Moreover, we think that the new type of arrow-loops, unknown in the Byzantine times, appeared at the same time as it did in the Crusader principalities; these enlarged bases were used whatever the status of the fortified site. But in Armenian Cilicia, the triangular base was clearly favoured; the semi-circular stirrups seem to have been introduced by the Military Orders around the 1210s. Unlike their counterparts in the Crusader principalities, Armenian builders showed no interest in more sophisticated features, like the long oar-shaped bases which developed in the castles of the Military Orders' castles during the second half of the thirteenth century.

Kingdom of Cyprus/Principality of Achaïa

The next medieval principality in the eastern Mediterranean to show enlarged-based arrow-loops is Cyprus. Actually, if we exclude the curious inverted semi-circular bases present in the gate tower at Bellapais (Figure II.12.6:4), which are clearly later than the end of the fourteenth century, arrow-loops with enlarged

41 Edwards, *The Fortifications*, 221–229.

42 Mathias Piana, "The Castle of Silifke, A Neglected Hospitaller Fortification in Cilicia," in *Castelos das Ordens Militares* (Lisbon, 2014), 227–251.

43 Edwards, *The Fortifications* . . ., 161–167. Hellenkemper, *Burgen* . . ., 242–249. Victor Langlois, *Inscriptions grecques, romaines, byzantines et arméniennes de la Cilicie* (Paris, 1854), 48.

bases are visible at only five sites, where they are all stirrup-shaped. Dating these castles, all under royal control, is as difficult as it is in Cilicia: it is generally proposed that after the fall of Acre in 1291, a huge effort of fortification was undertaken by kings Henry II and Amaury, but it is worth noting that this is purely conjectural.⁴⁴

At Famagusta (castle and town walls), one must examine the castle buildings, which are engulfed by Venetian fortifications, very carefully to recognize that the walls and towers had fine arrow-loops equipped with semi-circular stirrups. The works are attributed to Henry II and Amaury II of Lusignan, end of the thirteenth and beginning of the fourteenth century.⁴⁵

The same is true at Paphos, where a medieval tower is absorbed within an Ottoman fort: two arrow-loops with similar bases can be recognized: a dating in the second half of the thirteenth century was proposed but remains uncertain.⁴⁶ At Limassol, only a single half stirrup is visible: it has been reused when transforming the fortified church into an Ottoman fort, on its north-west side.⁴⁷

Cérine/Kyrenia was with Famagusta one of the most important castles and fortified harbours of the kingdom. Here again, we find arrow-loops equipped with semi-circular stirrups in all the curtains and towers (Figure II.12.3:4); the front to the north, with the horseshoe tower and the adjoining curtain is particularly interesting, as the same kind of arrow-loop was used when the walls were heightened. The medieval fortress could be attributed to the second half of the thirteenth century, or the fourteenth century.⁴⁸

Lastly, the castle of Kantara, built on a rocky mountain overlooking the plain of Famagusta and the Mediterranean, exhibits stirrup-based arrow-loops in the walls and towers of its large barbican or outer bailey. Their dating has been discussed; Morelle has proposed the first third of the thirteenth century, whereas Petre has stressed the fact that it could well be much later.⁴⁹ What can be said is that the

44 On the castles of Cyprus, see James Petre, *Crusader Castles of Cyprus. The Fortifications of Cyprus under the Lusignans: 1191–1489*, PhD, 2010, online (2020/07/09) <http://orca.cf.ac.uk/54199/1/U564882.pdf>. Camille Enlart, *L'art gothique et de la renaissance en Chypre*, 2 vol. (Paris, 1899), is still an interesting source, however outdated by the more recent studies, particularly Jean-Bernard de Vaivre and Philippe Plagnieux, *L'Art gothique en Chypre* (Paris, 2006). James Petre has summarized and analysed all these works in his PhD thesis.

45 Christian Corvisier, "Le château de Famagouste," in J. B. de Vaivre, Ph. Plagnieux, *L'Art gothique* . . . , 351–366.

46 Christian Corvisier, "Le château de Pafos," in J. B. de Vaivre, Ph. Plagnieux, *L'Art gothique* . . . , 391–405.

47 Christian Corvisier and Nicolas Faucherre, "Une chapelle templière dans la redoute turque? L'énigme archéologique du château de Limassol en Chypre," in *Utilis est lapis in structura. Mélanges offerts à Léon Pressouyre* (Paris, 2000), 345–371. See also Petre, *Crusader Castles*, 288–313, for a discussion on the origins of the fortification.

48 See Petre, *Crusader Castles*, 244–264.

49 Nicolas Morelle, "The Castle of Kantara – A Key to the Evolution of Active Defence in the 13th Century between the Eastern and the Western Worlds," *The Castle Studies Group* 28 (2014–15), 284–310. James Petre, "Commonality in Crusader Castle Construction in Armenian Cilicia and

barbican is clearly later than the walls of the upper castle, where a single enlarged-based arrow-loop can be seen to the right of the entry.

To summarize, true stirrup-based arrow-loops seem to be a feature of royal fortification in medieval Cyprus, even if they are not universally used. It seems probable that their introduction in the repertoire of the royal masons postdates the fall of Acre, but this is purely conjectural.

One might think that such features would also appear in the Crusader principalities of Greece: but in the principality of Achaïa, not a single castle (to our knowledge) shows enlarged-based arrow-loops. In the small venetian territory of Modon/Methone to the south of the Peloponnese, the town walls are flanked by square towers at regular intervals, unfortunately heavily weathered by marine erosion; arrow-loops survive in two of them, one of them with a perfect semi-circular stirrup. The town was conquered by the Venetians in 1206 and recognized by the new prince of Achaïa as an independent possession of Venice by 1209.⁵⁰ The towers are necessarily subsequent to this event, though there is no historical evidence for their date: it can be clearly seen that they are not bonded into the walls, so the dating is quite open.

Brief overview of the two Kingdoms of France (FR) and England (GB)

We have no evidence of such arrow-loops elsewhere around the Mediterranean, apart from the kingdom of France. It leads us to question the context in the territories of the two competing “superpowers” at that time: the Kingdom of France and the Anglo-Norman Kingdom. Within these are hundreds of sites showing arrow-loops with more-or-less sophisticated enlarged bases, continuing up to the fifteenth century: it is impossible to mention all of them here, but we will try to highlight the most important trends.⁵¹

Actually, the earliest known examples seem to show up in the Angevin territories, more precisely in Normandy at Domfront (FR), where the castle is defended on the east front by two polygonal towers and vaulted galleries equipped with several fine perfect fishtail-base arrow-loops (Figure II.12.5:1): it seems the whole

Cyprus: The Case for Kantara and the Catalyst of Korykos,” in *Crusader Landscapes in the Medieval Levant*, eds. M. Sinibaldi, K. J. Lewis, B. Major and J. A. Thompson (Cardiff, 2016), 241–259.

50 Kevin Andrews, *Castles of the Morea*, 2nd ed. (Princeton, 2006), 58–83, albeit published the first time in 1953, remains the sole detailed monograph of the fortifications; unfortunately, it deals very few with the detailed analysis and dating.

51 On this subject for France, see Jean Mesqui, *Châteaux et enceintes de la France médiévale*, vol. II (Paris, 1993), 251–300. Recent update and in-depth discussion in Denis Hayot, *L'architecture fortifiée capétienne au XIIIe siècle (1180–1270)*, PhD (Paris, Université Paris IV – Sorbonne, 2015; soon to be published), II, 377–387. For England, see Toy, *Castles of Great Britain*, 153–154. See also Neil Ludlow, “William Marshal, Pembroke Castle and Angevin design,” *Castles Studies Group Journal* 32 (2018–2019), particularly 222–227.

front was built by Kings Richard I and John I of England between the 1190s and 1204.⁵² The extraordinary arrow-loops in the keep parapet and Lunn's Tower at Kenilworth (GB), with hypertrophic fishtail bases and sophisticated design, are attributed to the same king before 1216⁵³ (Figure II.12.5:2); here the bases of the triangles were 60 cm wide, while the bases at Domfront are 30 cm wide. At the same time, the Bell Tower in the royal Tower of London (GB) shows fine circular bases in its arrow-loops,⁵⁴ whereas the castle of Pembroke in Wales (GB), built by the famous William Marshall, uses flattened rectangles as bases.⁵⁵ The use of enlarged bases of different forms were soon to become a common feature in the English castles; from the beginning of the thirteenth century, the builders often also used cross-slits.

Curiously none of the castles and town walls built directly by King Philippe Auguste of France (1180–1223) and his lords, within the royal historic territories (Ile-de-France, Normandy, Picardy, Berry) used such arrow-loops, as if their absence was a symbol of identity. But enlarged bases were rapidly adopted in neighbouring territories during the three first decades of the thirteenth century, particularly in the former Angevin territories now under French royal control, as show the stirrup-based arrow-loops in the wonderful almond-shaped towers at Loches (FR), built between 1205 and 1224.⁵⁶ The bases were mostly triangular or semi-circular, but circular or small square bases also occurred, all depending on the quality of the mason's work. In several cases they show cross-slits, which were to become standard in the English-held duchy of Gascony at the end of the thirteenth century (so-called *archères en croix pattée*, meaning arrow-loop with four enlarged extremities), and much later in Provence.⁵⁷

During the second decade of the thirteenth century more elaborated bases, known as oar-shaped, appeared in the Kingdom of France: a very homogenous group of such arrow-loops is represented in several castles built in Auvergne after

52 Even if J. M. proposed in 1991 a dating to the end of the thirteenth century, the historical context denies it categorically; in 1993 (*Châteaux et enceintes* . . . , II, 285), J. M. proposed instead to attribute it to John I, as the sources clearly confirm. For the sources, see Cécile Cormier, "La courtine à gaine du château de Domfront: construction, destruction, restauration," *Le Domfrontais médiéval* 24 (2016–2017), 7–29; Thomas Stapleton, ed., *Magni Rotuli Scaccarii Normaniae*, 2 (London, 1844), lix, 352.

53 Derek Renn, "Arrow-loops in the Great Tower of Kenilworth castle: Symbolism vs Active/Passive 'Defence'," *Castles Studies Group Journal* 25 (2011–2012), 175–179.

54 Edward Impey and Geoffrey Parnell, *The Tower of London* (London and New York, 2011), 21–23. Ludlow, "William Marshal . . .," 225, suggests these circular "oilllets" were a late addition.

55 Ludlow, "William Marshal," 225.

56 See Hayot, *L'architecture fortifiée* . . . , Annexes, 839–853, at 851. These towers were previously attributed to King Richard I before 1205, but a careful observation has shown that impacts of stones thrown during the siege of 1205 lack totally on their surface, whereas they are numerous on the walls. As the towers are not bounded into the walls, they are necessarily subsequent to the siege.

57 See the map published in Mesqui, *Châteaux et enceintes* . . . , II, figure 349.

the conquest by Philippe Auguste's armies in 1210–1213: apart from the case of Cluny (dated 1220 by dendrochronology) none of them is surely dated, but they certainly belong to the first half of the century, like the magnificent towers of Bourbon-l'Archambault, around 1220.⁵⁸ Outside of these regions, four particularly important cases must be stressed here. One of them has already been cited, the *Tour de Foix* at Blois (France) (Figure II.12.4:6), with its striking resemblance to 'Atlit's arrow-loops; unfortunately, there is not any precise dating. The other three cases are the towers of the bailey at the impressive castle of Coucy-le-château (Figure II.12.4:7), the castle at Nogent-le-Rotrou and the huge royal castle of Angers (all France), probably built exactly at the same time, i.e. in 1225–1235. At Angers, it was the first time that the royal architects used enlarged bases, in a particularly spectacular manner; most probably, the same architects intervened in the two other fortifications.⁵⁹

During the second half of the thirteenth century, enlarged bases were extensively used in French royal fortification, which mainly developed mostly in the south (Languedoc); the bases are triangular, or frequently quadrangular (spade-based), and a good example can be seen at Carcassonne (FR) (fig. 4.8). At the same time, more inventive forms were used by the English kings in their Welsh fortifications, like the double circular bases which can be seen at Caernarfon (GB), side-by-side with semi-circular and circular ones.

Discussion: origins, diffusion and use of enlarged-based arrow-loops

From the evidence gathered earlier, it seems clear that enlarged-based arrow-loops appeared around 1200, at the earliest, in Europe and in the Crusader states. We think that they were conceived in the Anglo-Norman region of influence, probably under the reign of King John. Their diffusion was rapid in all the territories of the former Anglo-Norman "Empire", were they under English or French royal control. In contrast, the rival King of France Philippe Auguste never used them in his fortifications: we will come back to that later.

In the Crusader principalities, *Margat/Qal'* at al-Marqab (Syria) is probably the first where such devices occur, certainly after 1202, but without any certainty about the exact date; all subsequent constructions of the thirteenth century seem to be equipped with enlarged bases. In Armenian Cilicia, the exact period in which they start to occur is not known. But it is our belief that all the fortifications mentioned here, characterized by a common architectural vocabulary (type of masonry,

58 Mesqui, *Châteaux et enceintes* . . . , II, 288. Christian Corvisier, "Le château de La Roche et la diffusion de l'archère 'en rame' en Basse-Auvergne au XIIIe siècle," *Congrès archéologique de France* 158 (2000), 101–115. Frédéric Didier, "Saône-et-Loire. Cluny, la «tour ronde» de l'enceinte abbatiale," *Bulletin monumental* 162 (2004), 312–316.

59 The dating of Coucy and Angers has been established for a long time. See Hayot, *L'architecture fortifiée* . . .

standardized U-shaped towers equipped by arrow-loops), did not develop until the beginning of the long reign of Het'um I (1226–1270).

The more elaborate forms, particularly the “oar-shaped bases”, were imported from the Kingdom of France. The fact that the royal fortification of Caesarea (Israel) is the first to use them in the Crusader states stresses the role of the royal architects in the design of the walls, since they had used the same design at Angers (France) 20 years earlier.

But one could also look at this question from another angle, since the south-east tower is the only structure in the entire enclosure in which these bases occur. In the Crusader states, this type of enlarged base was used only by the Templars, from *Chastel-Pèlerin* (Israel) to *Sagette/Saïda* (Lebanon). Would it indicate that the architects of the Temple's Order in the Levant adopted the “oar-shaped base” as a pattern of their fortifications, meaning that it was they who built the south-east tower of Caesarea? It has been shown recently that the north-east tower of the same enclosure engulfed a former gate of the Islamic walls granted to the Teutonics in February 1206 by Juliana of Caesarea.⁶⁰ Moreover, the kings and princes often granted the Military Orders specific sectors of the fortification, with the responsibility to build and defend them, as it is well known in the case of *Acre/Akko* (Israel).⁶¹ Thus, it would be possible that the unique tower of Caesarea showing oar-shaped bases was a Templar's construction.

Let us come now to the use of these devices. Table I shows clearly that there is no obvious correlation between the design of the embrasure (presence of a high sill, presence of a deep plunge) and the existence of enlarged bases. However, the general understanding is that they were meant to facilitate downwards shooting by the crossbowmen and archers. It was certainly true when they were large enough to widen the scope for the shooter. Nevertheless, the experiments led by Philippe Durand in 1998⁶² at three thirteenth-century castles, Le Coudray-Salbart, Castelnaud and Budos (all FR), showed that one has to be careful not to draw too simple theories. He tried shooting with a longbow, a recurve bow and a crossbow, and showed that in these cases fishtail bases were simply useless for the archers/crossbowmen. A lot of the “enlarged” bases listed earlier could not improve conditions for shooting downwards, simply because they were not carved deeply into the stone, or not wide enough.

Perhaps it was the reason why more elaborated forms appeared, such as the oar-shaped arrow-loops. With this kind of enlargement of the lower third part of the

60 Vardit Shotten-Hallel, Jean Mesqui and Uzi Ad, “Three Main Towers of Medieval Caesarea: Architecture, Their Role and Function,” in *Polioretics, The Art of Siege and Warfare from Antiquities to the Middle Ages*, eds Rabei J. Khamisy and Michael Eisenberg (Oxbow, 2020).

61 Jean Mesqui, “La « barbacane » du Crac des Chevaliers (Syrie) et la signification du terme dans le bassin méditerranéen,” *Bulletin monumental* 176–3 (2018), 215–234, here 219–220.

62 Philippe Durand, “L'expérimentation de tir dans les châteaux: de nouvelles perspectives pour la castellologie,” *Bulletin monumental* 156 (1998), 257–274, <https://doi.org/10.3406/bulmo.1998.1803000>.

slit, one could certainly expect that the downwards shooting would be considerably easier: it can be seen, for example, in Coucy (FR), where only the arrow-slits of the first floor were equipped with oar bases, whereas the slits at ground level were simple. It is also the case for hypertrophic fishtail bases like in Kenilworth (GB), where the bottom of the embrasure opened out as a square hole, allowing other projectiles to be dropped (Figure II.12.7).⁶³ Some have even proposed that these bases were intended for shooting or dropping burning missiles, which is imaginative but rather unrealistic.⁶⁴ Curiously, the most surprising use of such devices appears at Cluny (FR), where the embrasures could be used as latrines, with two lateral fillets on the sidewalls supporting a pierced seat in the embrasure (Figure II.12.8)!

But none of these features ever generalized outside of some geographical areas and a limited time span. We have seen that in the Near East none of them were used within Muslim territories and that in Europe the French royal masons never used them in the numerous fortresses of King Philippe Auguste, whereas at exactly the same time they were adopted in the Kingdom of England, as well as in the former Angevin territories in France. Similarly, the oar-shaped arrow-loops persisted for only a quarter of a century in France. Even in a huge castle like Coucy, only two of the nine similar towers flanking the outer ward show such bases. If they were so efficient, why did they remain so isolated? Shooting experiments undertaken by Derek Renn in 1981,⁶⁵ as well as those led by Philippe Durand cited earlier, showed that it was relatively easy for an experienced archer staying outside of the fortification to successfully shoot through the slit of a conventional arrow-loop, potentially hitting the shooter behind it. If it was the case for normal slits, the risk was even greater with oar-shaped arrow-loops.

What is striking, finally, is the fact that all the Christian fortifications built in the Near East during the thirteenth and fourteenth centuries used enlarged bases, whereas the Muslims, who obviously knew the fortifications of their enemies, never used them. It shows that these arrow-loops were perhaps more emblematic or identity-related than really needed for the defence. In our sense, they worked probably as symbols for their patrons and result of constant exchange of practices.

In the same manner, arrow-loops played a prominent role in ostentation and displaying the military strength of the owner: the gigantic arrow-loops of Najac (FR), Aigues-Mortes (FR) and Warkworth (GB) (in the latter two cases manned by two shooters, one above the other!) are very significant, as are also the extraordinary arrow-loops of Kenilworth Lunn's Tower (GB) with their wide fishtail, their

63 Humorously, Derek Renn asked the question if these fishtail bases were not an addition of the sixteenth century by Lord Leicester to "shower flowers" down on his invitees like ticker tape ("Arrow-loops in the Great Tower . . .", 179).

64 Alain Salamagne, "Origines et diffusion des embrasures de tir dans l'architecture militaire de la fin du XII^e siècle: une réévaluation," in *Le château médiéval et la guerre dans l'Europe du Nord-Ouest* (Lille, 1998), 61–75.

65 Derek Renn and Peter Jones, "The Military Effectiveness of Arrow-Loops," *Château-Gaillard* 9–10 (1982), 445–456.



Figure II.12.7 Kenilworth (GB). Interior of an embrasure in the Great Tower, with an hypertrophic square hole, behind the also hypertrophic fishtail base (see Figure 12.5). © Castle Studies Group, photo R.K. Morris

Proof

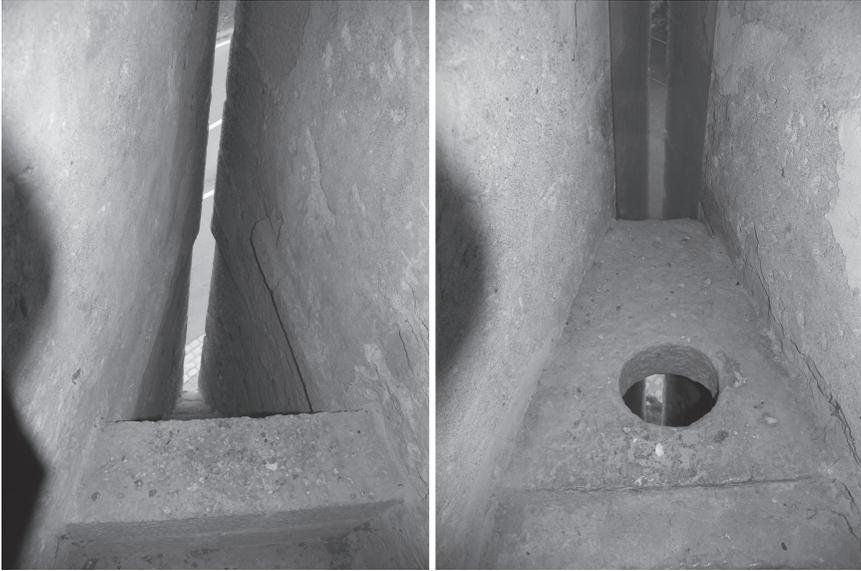


Figure II.12.8 Cluny (F). Round tower of the abbatial fortified enclosure. Two embrasures with oar-shaped slits, usable as latrines as well by addition of a pierced seat supported by two lateral mouldings (on the left, embrasure without stone, on the right embrasure with pierced stone). © CeCaB Hervé Mouillebouche

Not for distribution

cross slit and their recessed surrounds. Enlarged extremities were certainly one of the means by which arrow-loops were visually enhanced, as shown by the group of “*archères en croix pattée*” in Gascony. This need for ostentation and display is particularly emblematic at Caernarfon, where the Black Tower, built 1283–1292, exhibits at its base three dummy arrow-loops with circular oillets. They were simply carved in the surface of the exterior dressing, but the wall was plain behind: so, it was only to impress the observers!

For visual emphasis, arrow-loops were frequently distinguished from the surrounding masonry through the use of different building-stone, often carefully carved. In the Near East, where the bossed masonry was widely used, the stones forming the slit were often more finely and more regularly cut (see, for example, Toprakkale [Turkey]). The same can be said for the group of “highlighted” arrow-loops which have been recognized in some important Ayyubid fortresses (Bosra [Syria], Jerusalem [Israel], al-Kerak [Jordan] (Figure II.12.6:8), Rumkale [Turkey] (Figure II.12.6:9), Subeibe [Israel]). In these examples, all built by the Ayyubids or the Mamluks, the number of arrow-loops is highlighted by a specific

Proof

carving of the stones forming one side of the slit, generally a bossed block forming a vertical protruding edge parallel to the slit.⁶⁶

Military Order	Site	Location	Fishtail	Stirrup	Oar/Spade	Plunge	High sill
Kingdom of Jerusalem							
T	<i>Chastel Pélerin</i> / Atlit	Castle, southern front			∩	?	?
Teu	<i>Montfort</i> /Qal'at al Qurain	Upper Castle (primitive enclosure) Gateway	▲	∩		∆	?
		External enclosure (north, north-west)		∩		▲	?
T	<i>Beaufort</i> /Qal'at al Shaqif Amoun	Castle (south-west)	∆	∩		∆	?
	<i>Cesaire</i> /Caesarea/Cesarya	Urban enclosure (tower 11)			∩	▲	-
T	<i>Sidon</i> /Saida	Sea Castle (north west)		∩	∩	▲	∩
	<i>Smar Jbeil</i>	Castle (south wall, barbican)	∆	∩		∆	-
H/T	<i>Recordane</i> /Khirbet Kurdana/Tei Afeq	Keep		∩		∆	-
H/T	<i>Caco</i> /Qaqun/Yikon	Keep	▲			▲	∩
County of Tripoli							
	<i>Beaude</i> /Balda/ Arab al Muluk	Castle		∩		∆	?
H	<i>Crac des chevaliers</i> /Qal'at al Hosn	Reused in Mamluk tower 43 (south) External enclosure (west), "Barbican of Brother Nicolas Lorgne" External enclosure (north-east, south-east) External enclosure (eastern ramp) External enclosure (south east)	▲	∩		?	?
			∆	∩		▲	∩ -
			∆	∩		∆	-
			∆	∩		∆	-
H	<i>Margat</i> /Qal'at al Marqab	Castle (outer wall and north-east round tower) Urban enclosure (walls and western gateway)	∆	∩		∆	-
T	<i>Tortose</i> /Tartous	Inner enclosure			∩	▲	∩
Armenian Kingdom in Cilicia							
	Anahşa	Castle	∆			∆	?
	Anavarza	Castle lower enclosure (south east tower) Castle northern enclosure (northern tower)	▲			∆	-
			▲			∆	-
	Bakaçak	Castle	▲			∆	?
	Belenkeşlik	Keep	∆			∆	-
	Boğrueğri	Castle	∆			∆	?
	Çardak	Castle (south)	∆	∩		∆	?
	Çokak	Keep	∆			∆	-
	Eimalı	Fortified church	∆			∆	?
	Fındıkpınarı	Castle	∆			∆	?
	Güveloğlu/Gökvelioğlu	Castle	▲			∆	?
Teu	<i>Haruniye</i> /Harun Reşit Kalesi	Castle		∩		▲	∩
	Hebllı	Keep	∆			∆	∩
	Kız (near Dorak)	Keep	▲			∆	?
	Kız Kalesi (near Korykos)	Castle	▲			∆	-
	<i>Corycus</i> /Korykos	External enclosure (north, east)	∆			∆	?
	Sis/Kozan	Castle (eastern enclosure, barbican) Castle (southern upper tower)	∆			∆	-
			▲			∆	?
	Kuzuçubelen	Keep		∩		∆	-
	Mancılık	Castle	∆			∆	-
	Meydan	Castle	▲			∆	-
H	Silifke	Castle, lower and upper enclosure	▲			∆	-
	Sinap (near Çandır)	Keep		∩		∆	-
	<i>Skewra</i> /Sinap (near Namnun)	Keep	∆			∆	-
	Tece	Keep		∩		▲	∩
	Til/Toprakkale	Upper castle (west) Lower enclosure (south, east)	▲	∩		▲	∩
			▲			∆	-
	Tumlu	Castle	∆			∆	-
	<i>Ayas</i> /Yumurtalık	Urban enclosure	▲			∆	?
Kingdom of Cyprus							
	Bellapais	Enclosure (gate tower)		∩		-	-
H	Famagouste	Urban enclosure Castle	∆	∩		∆	?
			∆			∆	∩
	Kantara	Castle	∆	∩		∆	?
	<i>Cerines</i> /Kyrenia	Castle	∆	∩		∆	-
T	Limassol	Fortified church		∩		∆	?
H	Paphos	Keep	∆			∆	?
County of Achaïe (Greece)							
	<i>Modon</i> /Methoni	Urban enclosure		∩		∆	?

66 Goepp, "Les archères . . ." 44; Cyril Yovitchitch, *Forteresses du Proche-Orient: l'architecture militaire des Ayyoubides* (Paris, 2011), 310–313.