

«La Navigation du Savoir Project» and the Search of Malta's Late Medieval Ship-Shed

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The Maltese Medieval Arsenal

The EU-funded project *Navigation du Savoir* set in motion research on the first known Maltese arsenal, which according to archive records dates back to late medieval times. As part of the synergies advocated by the EU through its MEDA Heritage, in particular that of linking *Navigation du Savoir* project with other projects on maritime research, I participated in November 2005 in a workshop held at the historic city of Ravello, Italy, on classical and medieval arsenals and ship-sheds. At this conference, I presented the results of the *Navigation du Savoir* project and its intrinsic values for the maritime arsenals of the Mediterranean. It was thanks to this participation that I furthered my knowledge on Maltese arsenals, in particular, the search for Malta's medieval arsenal. Moreover, I could compare the results of my studies and research with those of other scholars working in this field. I found that my research was in line with the various studies presented in the course of this three-day conference at Ravello. This gave me the opportunity not only to enhance my studies but to complete this paper, which is being published in this volume of proceedings of the conference on the Historic Arsenals of the Mediterranean, held in Malta in October 2004 as part of the *Navigation du Savoir* project.

First of all, one has to point out that Malta's medieval period ends in 1530. The arrival of the Knights of Saint John on this Island in this year is considered by Maltese historiography as the beginning of the early modern era. However, the presence of a Maltese shipyard can be dated to well before that period. Late medieval registers refer to the existence of an arsenal in Malta. The earliest known date goes back to 1374 and was given by Professor Godfrey Wettinger in an article recounting the story of the town of Birgu, where the arsenal

was situated¹. Recently, this important document was published in full by Professor Stanley Fiorini in his book *Documentary Sources of Maltese History Part II Documents in the State Archives Palermo No. 1 Cancellaria Regia: 1259–1400*². In 2000, Mr Joseph Muscat, a Maltese maritime historian, postulated a description of the format and structure of the Birgu medieval arsenal in his booklet on the history of the Birgu galley arsenal³.

The aim of my study is not to produce new material on the Maltese medieval shipyard. There is not much new material to be published, unless new research is undertaken in foreign archives. Most of the medieval documents have already been combed and analysed. The aim, rather, is to place the local shipyard within the general framework of the medieval arsenals in the Mediterranean at the time. The study of the Maltese medieval arsenal within this wider context can bring to the fore interesting observations and conclusions.

The most famous late medieval arsenals in the central and western Mediterranean were Barcelona, Pisa, Genoa, Venice, Dubrovnik and Amalfi. The study of these arsenals can help put forward sound conclusions with regard to the Maltese arsenal, on which very little information has survived. Furthermore, in recent times the medieval Venetian arsenals in Cyprus as well as the medieval arsenal of Alanja in Turkey have attracted the attention of leading maritime scholars⁴.

There can be no doubt that Malta in late medieval times needed arsenals due to the fact that there were islanders who were ship owners. For instance Giacomo Bosio, the historian of the Order of St John, refers to the sea captain Michele di Malta, who indulged in piracy.⁵ The abuses committed in the Aegean Sea, when he attacked Christian ships, caused

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1. G. Wettinger, "The Castrum Maris and its Suburb of Birgu, during the Middle Ages", *Birgu A Maltese Maritime City* (Malta, 1993), pp. 31-72.
 2. *Documentary Sources of Maltese History Part II Documents in the State Archives Palermo No.1 Cancellaria Regia: 1259-1400*, S. Fiorini (ed) (Malta University Press, 1999), Doc 122, Cancellaria 14, f. 69, pp. 118-119.
 3. J. Muscat, *The Birgu Galley Arsenal* (Malta, 2001).
 4. The Ravello Conference sought to do justice to these medieval arsenals, for besides referring to the well-known arsenals of Italy, the arsenals of Cyprus and Alanja (in historic Armenia) were also analysed and discussed.
 5. G. Bosio, *Dell'Istoria della Sacra et Illustrissima Religione di S. Giovanni Gerosolimitano* (Rome, 1630) Vol. 2, p. 311.

his vessel to be intercepted by the galleys of the Knights of St John, who in this period resided at Rhodes. Michele di Malta died in a skirmish between his vessel and that of the Knights. Additionally, the local notarial records make reference to *Magnificus Antonius Gactu Desguanes* as one of the leading corsairs present in Malta at the end of the fifteenth century⁶. Yet according to the Maltese medieval historian, Professor Godfrey Wettinger, it was not normal that shipbuilding of large vessels was carried out in the arsenal of Birgu. On the contrary, this arsenal was merely used for ship repairs and the occasional construction of boats for the transportation of wheat⁷ or to be used in corsairing activity⁸. Unfortunately, the documents consulted did not make reference to the name of the arsenal where the boat or ship was to be built. The total re-haul of ships, in particular big boats, did take place at the arsenal of Birgu.⁹ The building of big ships took place in the royal arsenals in Sicily or else in other arsenals that belonged to the House of Aragon, of which Malta then formed part. Furthermore Professor Wettinger does not exclude the possibility that ship repairs to vessels belonging to the islanders could have also taken place in one of the other big arsenals in Europe¹⁰, perhaps in that of Messina, which was the most important arsenal in late medieval Sicily. The fact that the Birgu yard lacked a flourishing shipbuilding enterprise can even be confirmed from an urban analysis of Malta's harbour cities.

Throughout the Mediterranean, the most important cities were situated along the coast or next to a navigable river; this is not applicable to Malta. The only city that existed in Malta prior to 1530 was situated right at the centre of the island, in the middle of a rural area, and Birgu only existed as a small suburb which was protected by a small castle. On the other hand, important arsenals in the Mediterranean always had at their rear well-inhabited cities, and in many cases the population of these

6. *Part 1 : Notarial documents (No. 2, Notary Giacomo Zabbara, R494/1(II-IV), 1494-1497)*, S. Fiorini (ed.) pp. 20, 78, 80-81,

7. Notary Archives Valletta, Canciur, R 140/1 f. 40r-v.

8. S. Fiorini, *Part 1: Zabbara*, p. 20; *Part 2 : Documents in the State Archives, Palermo (No. 1, Cancelleria Regia, 1259-1400)* \t "_top" S. Fiorini (ed.), vol. 159, f. 211v-212.

9. I owe this information to Professor Godfrey Wettinger.

10. Wettinger (Malta, 1993), p. 66.

cities ran up to more than 5,000 people. This explains in part why the Malta yard was not important in the late medieval period. It became important once Birgu began slowly to emerge as a real hub of international activity, but this only took place after 1530. In my opinion, it is only at this point that one can begin to speak about an arsenal. Considering the minor importance that Birgu had in the history of the Central Mediterranean in late medieval times, for centuries it could only have housed a “ship-shed” rather than a fully-fledged arsenal.

The Difference between an Arsenal and a Ship-Shed

The English words used to describe yards like the one in question varied from the word *shipyard*¹¹ to that of *dockyard*¹² or *arsenal*¹³. Whilst these terms are all valid, reflecting different connotations that various authors and historians might wish to impart – I myself employed some of these terms in the previous paragraphs – I would like to propose another English term, that of a “ship-shed”, which I think better suits the maritime activity and function of this work area, at least for the fifteenth century. At this point, one needs to give credit to Professor Wettinger for drawing attention to the rather arbitrary manner in which this yard in Birgu was being described. In fact, his article on the *Castrum Maris* of Birgu indicates that perhaps the right phrase to be used is *boatyard*¹⁴.

I would add the following. The *Oxford English Dictionary* gives the following two meanings for the English term *arsenal* that, for the purpose of this paper, I believe worth reproducing and analysing. The first explanation means “a dock possessing naval stores, materials and all appliances for the reception, construction and repair of ships: a dockyard”. The second is in part related to the first and describes an arsenal as “a public establishment for the manufacture and storage, or for storage alone, of weapons and ammunitions of all kinds, for the military and naval forces of the country”. This does not vary much from the meaning given to

11. Fiorini (Malta, 1999), pp. 118–119.

12. G. Wettinger, *Acta Iuratorum et Consilii Civitatis et Insulae Maltae* (Palermo, 1993), doc 698 p. 675.

13. J. F. Darmanin Demajo, “The Building of the Order H.M. Victualling Yard”, *Melita Historica*, Vol. ii, No. 2, 1957, p. 67.

14. Wettinger (Malta, 1993), p. 66.

the word *arsenal* for the Republic of the *Serenissima* of Venice. According to E. Concina, the term *arsenatus* in Venice meant “*un deposito di legname e stoccaggio*”¹⁵. Concina further explains that the word “*arsenale*”, in the sense of a military structure, entered Venetian vocabulary between 1443 and 1545 and meant both an organisation of a maritime fleet as well as a structure in which the building of ships took place directly under the patronage of the State¹⁶.

An equivalent word with the same meaning was used to define the late medieval arsenal of Pisa, which was referred to as a *tersana*. According to Fabio Reali, no construction of ships took place in the medieval arsenal of Pisa. Instead, at this arsenal war-ships were armed or repaired. The construction of ships took place outside the area of the arsenal, in a shipyard which was situated to the east of the *tersana*, outside the surrounding wall of the arsenal¹⁷.

In Maltese documentation, the first reference to this kind of work area in Birgu does not strictly speak about an arsenal but of a *tarsianatu*, which is a word of Siculo-Italian origin. Whilst *tarsianatu* and *arsenatus* are derived from the same Arabic word, “*daar senaa*”, meaning the “house of crafts”, by the Late Middle Ages they had different meanings, even if both words depart from the same etymology. In the case of Malta, both for geographical and functional purposes, the word employed was related to the Sicilian nomenclature, which is a vestige of the Arabic domination of Sicily. In fact, it was a later medieval practice in Malta for the notaries and scribes to rely on the Maltese vernacular or the Sicilian dialect each time they failed to find an appropriate Latin word for the description of a place, action or event. At this period, the written language consisted of a very rudimentary Church Latin supported by Sicilian dialect, which was often the mother language of the scribes and notaries working in Malta at the time. The fact that the scribes used the word *tarsianatu* and not the Latinized *arsenatus* was not arbitrary but was determined by the need to find an appropriate meaning to describe the activity that was

15. E. Concina, *L'Arsenale della Repubblica di Venezia* (Milano - c1984).

16. *Ibid.*

17. F. Reale, “La Tersana di Pisa da arsenale della Repubblica a fortezza fiorentina”, *Pisa e il Mediterraneo. Uomini, merci, idee dagli Etruschi ai Medici*, M. Tangheroni (ed.) (Skira - Milan, 2003), p. 157.

taking place in this specific building. At first, both terms, that is, *tarsianatu* and *arsenatus*, meant simply a storage place, but the latter term began to be employed by the middle of the fifteenth century in relation to military functions and in this case for warships. The term *tarsianatu* seems to have taken longer to be influenced by this semantic change. In fact, when it was employed again towards the end of the fifteenth century for the Birgu yard, this was now being used in connection with the new meaning that the word *arsenale* had begun to convey, that of a military structure, as the ship-shed of Birgu was called in the document a *darsanali*¹⁸. In other words, by the late fifteenth century the Birgu yard was serving for more than storage, but was also the place where ship artefacts were being repaired if not also produced. The fact that the Maltese documents alternate between the use of *darsena*¹⁹ and *tarsena*²⁰ seems to be an indication of the functions that were taking place within the yard.

The employment of term *tarsianatu* implies that this place was not being used for the building of ships but was an area for storage. This was the purpose of the Maltese yard, at least in the fourteenth century. This meaning is also supported by the document itself, which made use of this term, as the word *tarsianatu* was used in connection with a galley that had been left idle, and even to rot, in this yard. The description of the state of the galley implies the existence of a ship-shed. In other words, the late fourteenth-century arsenal consisted of a yard which was covered by a tent or a shed and used mostly as a place of storage.

The next time that this term is encountered in the acts, the word used is *darsanali*. This use is contemporary with the change that was being effected in other places of the Mediterranean, and implies that the yard in Birgu was not only serving as a place of storage but also as a place for the repair of ships; it was also being used as an area where all sorts of crafts related to maritime activity were being constructed. This is

18. Wettinger (Palermo, 1993), doc 698, p. 675.

19. Cat(hedral) Arch(ives) Mdina, Misc. 439. *Universitas*, No. 3, f. 10. "Die vii de Fraru 1501. deglianu petri alu darsena".

20. Cat. Arch. Mdina, Misc. 439. *Universitas*, No. 3, f. 17v. 25 October (6 indiction) 1501. *In alia per las portas della Tarsena de todas causa tari xiii grani vii*. I owe this information to Professor Godfrey Wettinger.

corroborated by the evidence present in the 1478 document, as the Birgu *darsanale* is described as having had a boundary wall. The introduction of security measures at medieval shipyards is more often than not related to yards used for military purposes.

The issue of security re-emerges again in the documents of 1501, 1502 and 1503. The area is once called *darsenal*²¹ or *tarsenal*²² or even *arsenal*²³. In other words, the pronunciation of the word was moving towards the semantic meaning of the word arsenal. From these documents, it is known that this boatyard had its own staff, as workers from the yard assisted the master blacksmiths in their repair works. The 1501 documents state that in that year, stone was cut from this site whilst during that same year, blacksmiths were commissioned to mould iron hinges for the door that used to close this building. The same door seems to have needed further repairs as it was again repaired in 1502, whilst stone is again recorded as having been quarried from this area in 1503²⁴. One can consider that these two documents contain the first specific information regarding the presence of a fully-fledged arsenal in Malta.

Judging from the above documentation, there is no doubt that there was no important shipyard or arsenal in Malta during the fourteenth century. The yard was simply a ship-shed used mostly as a resting place for abandoned ships. There must have been some development at this yard during the late fifteenth century, where the repairing services were either introduced or were enhanced, and this necessitated the introduction of security measures, such as boundaries, walls and locks. However, whilst the appellation given to the Birgu yard in the 1478 document is the nearest to the new meaning conveyed by the term arsenal, the question arises whether it was at this period that the local ship-shed began to be transformed into an arsenal, or whether this transformation occurred in the 1530s, that is, during the first decade of the rule of the Hospitaller Knights in Malta.

Thus, for the purpose of this study, I shall be putting forward the hypothesis that in late medieval times, Malta had a ship-shed but did

21. Cat. Arch. Misc. 439, *Universitas*, No. 3, f. 10.

22. *Ibid.*, f. 17v.

23. *Idem*, *Univesitas*, No. 8.

24. Wettinger (Malta, 1993), p. 66.

not possess a proper arsenal, and if ship building took place, I conjecture that, as was the case with Pisa, it was undertaken outside the precincts of the arsenal. In fact, one needs to emphasise that the term ship-shed carries quite a different meaning from the attributions which are normally associated with the term arsenal. Ship-shed suggests not only a rudimentary structure consisting of a big shed, which was at first used as a storage place, but also a facility where light repair activity could be undertaken. Yet its primary function was to serve as a boatyard, where small boats or ships were hauled ashore for the winter months and where general maintenance and repairs could be carried out.

The differences in these two terms, as well as the origin of the word *arsenal*, can help us understand what type of maritime activity took place in Malta during the late medieval period.

I shall be arguing in this paper that both in terms of structure and location of the arsenal, the medieval arsenal in Malta followed the prevailing Mediterranean model whereby repairs and shipbuilding took place either in the open, uncovered spaces or else under open sheds. Later on this shed was surrounded by a boundary wall, so that it was turned into a workshop in which all the crafting needed for the construction or repair of boats or ships took place. Incidentally, as I shall be also explaining, the term *tarsena* used in the documents points to such industrial activity, whilst construction, whenever it took place, could have taken place outside the boundary wall of the shed.

At the same time, the activity at this yard needs to be related to the need for more security in late medieval Malta. The frequent raids on Malta by the North African regency increased the urgency for better security at the arsenal. Moreover, from 1480 onwards Malta, like the rest of the Mediterranean, began to feel the need for fortified enclaves as a result of the increasing power of the Ottoman Empire. It was in 1480 that Malta suffered the first Turkish raid. The documents that have come down to us attest to the lack of security in the yard, and at least on two consecutive occasions a record was kept of the repairs made to the gate of the arsenal. The area was becoming, more and more, an enclosed arsenal of war.

The fact that in the year 1374 there is a record that a hull of an old galley lay abandoned in the Malta shipyard indicates that the structure

dated back in time and, taking into consideration the year of this document, one can definitely conclude that the shipyard was already in existence in the fourteenth century. Moreover, this document seems to confirm the idea being presented, namely, that Malta had a ship-shed rather than an arsenal or shipyard. The document speaks about a hull of a ship that had been lying in the yard for a number of years. The document does not specify whether the galley was lying berthed next to the quay or resting on land. The first theory appears to be the more appropriate. If the ship referred to in the document was not really a galley then it could have been beached as, once launched, the galleys or other big ships were not easily hauled ashore. This document speaks about “an old galley which belonged to the late Hugueni Lanzani, which is now lying at our shipyard in the said island, is in bad repair and not good for sailing”²⁵. It is the fact that the galley was described as *devastatam et inhabilem ad navigandum* that seems to imply that it was not lying next to the quay but hauled overland and hoisted on wooden beams. Irrespective of whether the old galley was still in water or on land, such a description implies the existence in Malta of a ship-shed rather than a proper arsenal. However, there is no precise date indicating the year in which the Maltese ship arsenal came into existence or the century in which it became operational. In all probability, the Maltese arsenal developed at the end of the medieval period.

During the Arab period, between 870 and 1091, there is no doubt that Malta did not possess an arsenal. The fact that Malta had no form of arsenal in the Arabic period can be found in the description that the Arabic geographer, Ibn Hawqal, gives of the islands of Sicily and Malta. A detailed reading of his description of the two islands implies that Malta lacked any form of arsenal. In his description of Sicily, Hawqal refers to the Arabic arsenal at Palermo. At the same time, in the geographical description of Malta, Hawqal makes no reference to the existence of any such building. This, in my opinion, excludes the possibility that Malta had an arsenal during Arab rule.

25. Fiorini (Malta University Press, 1999), pp. 118–119. “*galeam nostre curie veterem que fuit quondam Hugueni Lanzani sistentem scilicet in tarsianatu nostro dicte Insole tamquam devastatam et Inhabilem ad navigandum*”. Fiorini (Malta University Press, 1999), pp. 118–119.

This affirmation finds further support in Al Himyari's text. Unlike Ibn Hawqal, who was a contemporary of the Aghlabid rule over the islands of Malta, Al Himyari was writing three and half centuries after the end of the said rule in 1091. Al Himyari stated that Malta "has harbours set up for ships"²⁶. The use of the present and the fact that he is making a geographic statement suggests that he is referring more to the importance that the harbour of Malta had in his actual time, that is around 1461, than to the time when Malta was under Arabic rule. This is strengthened by the fact that he also makes reference to the maritime importance that the island had to the Aghlabid Empire. In this case, he reverted to the use of the past tense by stating that Malta "was visited by shipbuilders, because the wood in it is of the strongest kind"²⁷. By such a statement, the author categorically excludes the presence of an arsenal. Instead he is emphatically specifying that it was only visited by shipbuilders and the implication is that after they had chosen and chopped down trees, the wood was transported out of the island.

Despite the fact that other Arabic geographers claim that there existed numerous trees on the island of Malta, including pine wood which was good for ship building and repair²⁸, these primary materials were exploited by the Arabs for their seafaring expeditions but only in terms of raw material. They did not care to or failed to establish any ship building industry in Malta. The next proof can be found in Maltese Semitic vocabulary. The Maltese language lacks the Arabic word *daar senaa*. When this word entered the Maltese language, it entered through the Sicilian dialect. In fact, there is a general agreement among linguists that the Maltese word *tarzna* (meaning arsenal) is derived from the Sicilian language²⁹.

Thus, the setting up of an arsenal in Malta has to be associated with the expulsion of the Arabs and the return of Christianity to Malta. Based on the first references to the existence of an arsenal in the local archives, one can rightly conclude that this building came into existence in the

26. J. M. Brincat, *Malta 870-1054. Al-Himyari's Account* (Malta, 1991), p. 2.

27. *Ibid.*

28. *Ibid.*

29. E. Serracino-Inglott, *Il-Miklem Malti*, Vol. VIII (Malta, 1984), subvoce, *tarzna*, p. 358.

fourteenth century, when Malta was part of the Kingdom of Aragon. In other words, the same kingdom that owned the arsenals in Barcelona built the Maltese ship-shed in Birgu.

In the light of the above history of the Birgu yard, there are three questions which now remain: first, when did the transition from a ship-shed to an arsenal take place? Second, what did the arsenal look like in late medieval times? Third, where was it situated in Birgu? In answer to the first question, I shall be proposing two theories. Either the transition occurred at the turn of the sixteenth century, and the stone quarrying works recorded in 1501 and 1503 are somehow related to this change, or else the Birgu ship-shed became a fully operational galley arsenal with the arrival of the Knights in 1530. Some argue that the Knights' arrival in Malta may have triggered the enlargement of the medieval arsenal to make it suitable for the building of galleys. Whatever the case, after 1530 Malta had a galley arsenal, and this was situated on the same quay where the old medieval ship-shed was situated. Whether the galley arsenal was at first an extension or transformation of the old medieval ship-shed at the turn of the sixteenth century still has to be established, even if, judging from the timeframe, there was not much time to make big alterations as in 1539, the Knights' Chapter General decided to build a new arsenal at a different location on St Lawrence Quay³⁰. An answer to these questions can help in establishing whether a rib-arched warehouse, that until recently existed on the Birgu quay, served as the shed of the Birgu arsenal. If it served as the arsenal's shed, then one could establish when it was constructed, as there would be no doubt that it represented the point of transformation of the Birgu yard from a ship-shed into an arsenal.

What did the Maltese Medieval Arsenal Look Like?

Having established the difference between an arsenal and a ship-shed, and having established that perhaps the chances of Malta having a ship-shed rather than an arsenal were higher, and that the models of arsenals that one needs to study to better understand the Maltese structures are the European rather than the Arabic ones, I will now move on to analyse

30. AOM 297, *Liber Capitulorum Generalium 1526-1548*, f. 80r.

a hypothetical structure for this building, basing my arguments on comparisons with the arsenals of Amalfi, Pisa, Genoa and Palermo, in particular.

According to Mr Joseph Muscat, the medieval arsenal in Birgu consisted of one shed, covered by a wooden ceiling³¹. If such an assertion is correct, this continues to confirm that Malta had a ship-shed rather than an arsenal. The assumption that the Birgu medieval arsenal had a wooden ceiling finds confirmation in the fact that various medieval arsenals at the time had such a structure. For example, the old arsenals of Pisa, which have been extensively covered by the *Navigazione du Savoia* project, had a wooden ceiling. Originally, the ceiling of the arsenal of Genoa was also covered with planks of wood. The old arches, at least, were covered with wood³².

The arches of Genoa have partly survived. They date back to the thirteenth century, which means that they are practically contemporary to the setting up of this arsenal. Those of Pisa were mostly destroyed over the years. These were not the only arsenals with wooden ceilings. Those of Barcelona were also covered by wood. This is a very significant fact when one considers that Malta formed part of the Aragonese Empire, and that by this time the most important arsenal in the *Regno* was that of Messina. Secondly, in the late Middle Ages, the traditional trading and sailing partners were the Pisan and the Genoese. Malta was excluded from the maritime route of Venice and Amalfi.

The historical trajectory of these two cities, Venice and Amalfi, was different from that of Malta. As in the case of Malta, they originally made part of the Oriental Empire, but whilst the former became prey to the Arabic Empire in 870, these latter two cities continued to be part of Constantinople until progressively they gained autonomy to the extent of rivalling their past master. When Malta began slowly to return back into the European sphere of influence after 1091, Maltese traders did not have much contact with these two port cities, which had arsenals with stone ceilings. The arsenal of Amalfi does not fall on the routes of Maltese

31. Muscat (Malta, 1993), p. 5.

32. This assertion has also been re-affirmed by Daniela Pittaluga during the workshop at Ravello. The Genoese medieval arsenal was situated at a different place from that of the present historic arsenal.

medieval trade. By the thirteenth century, the city of Amalfi was in decline. It had come under attack from the Normans and afterwards from the emerging city of Pisa.³³

This arsenal consisted of two halls supported by stone arches but its ceiling was constructed in stone slabs. The Alanja arsenal in Turkey has a number of vaults made of stone. The vaults had a separating space in between whilst the ceiling, as in Amalfi, was made of stone. The same argument holds for the arsenal of Venice. At least, by the thirteenth century, it had a stone-covered ceiling.

It should be noted that in early modern times, stone ceilings were introduced both in the arsenal of Genoa as well as in the new Medici arsenals of Pisa. The so-called *arcate nuove* or new arches of Genoa were introduced in the 17th century. At first, these arches were made of stone and then covered with wood³⁴. Therefore, it was natural for Maltese ship builders to be inspired in their work by the existing structures they saw on their journeys, such as the buildings of Pisa, Genoa or Barcelona, rather than from buildings that fell outside their sphere of reference, such as Venice, Amalfi or Alanja in mainland Turkey. Besides, despite the fact that the arsenal of Amalfi was also situated in the Tyrrhenian Sea, like Genoa's and Pisa's, it had already lost its pride of place by the fifteenth century, when the Maltese arsenal came into real operation.

It is to be surmised that a wooden structure was built of strong wooden beams, and it was on these beams that the supporting roof was made to rest. The wooden roof structure sloped from the centre, giving it the shape of a gabled shed. At least this is the theory proposed by Joseph Muscat, who also maintains that the columns of the Maltese ship-shed were made of wood. Thus, these structures were far weaker than the existing and more established arsenals of Pisa and Genoa. Also, this would

33. M. Tangheroni, "Pisa e le Repubbliche marinare", *Pisa e il Mediterraneo. Uomini, merci, idee dagli Etruschi ai Medici*, M. Tangheroni (ed.) (Skira - Milan, 2003), p. 139.

34. The ceiling completely constructed in stone and built in the form of a barrel vault, was introduced for Genoa's arsenal, towards the end of the eighteenth century. In Malta, the barrel vault system for arsenal structures was introduced as early as the late sixteenth century for the arsenals of the galleys in Birgu. At first it consisted of two barrel vaulted arsenals. At the turn of the seventeenth century, another vault was added to this arsenal.

signify that the Maltese medieval ship-shed was a makeshift structure. Such a structure would need little maintenance and care, in the sense that at a time when labour costs were very low, its small size and its open areas and structure implied low-maintenance costs both for its upkeep as well as in the case of a need for changing the wood. In this respect, the Maltese ship-shed fulfilled an important characteristic that prevailed in medieval arsenals.

Generally, ship-sheds were rectangular in shape, surrounded by a medium-high wall. As the Malta ship-shed seems to have consisted of one rectangular bay, the wall was either not continuous or else had pillars made out of wood or stone to support a wooden ceiling. The arsenals of Amalfi, Genoa or Pisa were made of more than one shed. The internal division between the sheds or ship-shed did not consist of a straight wall, but of a number of adjoining walls, with a space between one wall and the next, with each wall also serving as a pillar on which the ceiling would rest. As in Malta the arsenal was made of one shed, such internal division being non-existent. However, there are questions regarding the construction of the surrounding wall of the ship-shed. Most probably the gabled shed rested on wooden columns which in turn supported wooden beams. In between, a small dividing, free-standing wall was built. In fact, it was customary for ship-sheds to have a long wall around them, a few feet in height (although the height varied) between which wooden pillars were inserted to support the beams that held the roof. At the initial stages, the walls did not serve as boundaries as space was left in between, turning them into small rectangular pillars. In fact, they were more often than not free-standing structures. Then, it was towards the end of the fourteenth century, when major security was introduced in the arsenal, that the free-standing structures were done up to turn the shed into an enclosed pen, and access to it was made possible through a wooden gate.

Another possible theory regarding the structure of the Maltese arsenal could be that it was made of stone or that at some point the original wooden structures, including the ceiling, were replaced by stone pillars. If this is the case, then the arsenal followed architectural structures similar to those used in the dockyards of important European harbours, such as the new arsenals of Pisa, Amalfi and the modern arsenals of Genoa. Such a change could only have come about in the sixteenth century, and

the most plausible date for such a transformation in structure could have occurred with the arrival of the Knights.

There were a number of security features in Malta's medieval arsenal, which in part confirm the belligerent nature of the building. The ship-shed was closed by a boundary wall and a gate which was closed by a wooden door. Such security features were common in all other military arsenals at the time. Ship-sheds for boats not used for war purposes often lacked any form of security and boat repair was undertaken in open structures, a tradition that remained alive in Malta until recently, as the boat-house situated in Pietà confirms.

The argument in favour of the existence of a ship-shed in Malta prompts a second consideration which a researcher in this field needs to ask. Was this structure used solely for ship repairing or was it also used as a shelter for ships during the winter months? Were the ships towed overland and parked under these sheds? The second possibility only holds ground for small and medium-sized boats. One is tempted to conclude that the ship-shed focused on ship repair, even after taking into consideration the fact that this area was occupied by the arsenal on the Birgu quay, and that Birgu was Malta's only harbour in late medieval times, with little importance in respect to the rest of the Mediterranean world. This does not exclude the possibility that ships sometimes had to be built anew.

There are already elements of transition from a ship-shed to an arsenal at the turn of the sixteenth century. Early sixteenth-century documentation seems to point to the fact that big boats that were used for the transportation of food and merchandise between Malta and Sicily were towed onto land. Records exist of a general refitting and repair of boats. The extensive work employed meant that boats or small ships were being rebuilt anew.

There is no doubt that repairs were held in a ship-shed which was by no means used as a boathouse, even if the reference in documents to the general refit of boats could signal the point of transformation from a ship-shed to an arsenal. However, the fact remains that, unless proved otherwise, ship building, in particular big ships and galleys, did not take place at Birgu. During this period, this type of ship building usually took place in important Mediterranean cities. The presence of a ship building arsenal

made the hosting cities a point of reference in the maritime history of the Mediterranean and enhanced the cities' political importance. Such a primacy was not enjoyed by the town of Birgu. As shall be confirmed in the following section, the prevailing theory in connection with the Maltese arsenal during late medieval times is that building of big ships did not take place in Malta but at one of the royal arsenals of the Aragonese kingdom, even if there were local historians, such as Gan Anton Vassallo, who hinted that ship building did take place at the Birgu arsenal in late medieval times, when he affirmed that this harbour was visited by a considerable number of ships³⁵. However, he failed to specify the type of ships or whether they belonged to Maltese owners.

The recent publication by Professor Stanley Fiorini of the contracts by Zabbara reveals a contractual deal for the formation of a partnership agreement between Antonius Gactu Desguanes, Dalmas Bagliu, Paulus Micallef and Lucas Bagliu for the building of a "barkycyam" to be used in corsairing activity. The deed was signed on 22 October 1494³⁶. Professor Wettinger has brought to my attention two documents concerning the construction of a ship. However, these documents should not be taken to refer to the building of big ships of medium-size length running to about 15 to 20 metres. Both the brigantines and *fuste* were in the range of such measurements. The first one is a deed, signed on 14 April 1500 by Tomeus Muscat, Tomeus Galdes and Vincenzius Barbara in front of notary Canciur, who was also parish priest of Bir Miftuh, whilst Clericus Blasius Grima, Nicolai Hellul and Petrus Hellul acted as witnesses. By this deed, Muscat, Galdes and Barbara agreed to form a society to build a *brigantium* which was capable of carrying 50 *salme* of wheat. Muscat agreed to pay for half of the expenses whilst Galdes and Barbara pledged to equally pay for the remaining half. Unfortunately, these two documents fail to indicate at which shipyard these vessels were to be built, even if one suspects that the construction would have taken place at the Birgu arsenal³⁷. The second document handed to me by Professor Wettinger is more specific. This is from the *Regia Cancellaria*

35. G. A. Vassallo, *Storia Di Malta* (Malta, 1890), p. 223.

36. S. Fiorini, *Documentary Source History – Zabbara. Part 1. Vol. 2. 22 October 1494* – Document 19.

37. Notary Canciur R 140/1 f. 40r-v.

of Palermo and is dated 1486. This document refers to the construction and launching of a *fusta* owned by Giovanni De Nava. As during that year there was only one possible arsenal in Malta, such a launching of a boat (unfortunately this document does not speak about general repairs or a totally new construction, though the latter seems more to have been the case) could only have taken place from the Birgu arsenal³⁸.

The Location of the Maltese Medieval Boatyard

The first specific written reference to the Maltese medieval arsenal was given by Ettore Rossi in his book on the Hospitaller squadron. In this book, Rossi avoided the question of the medieval arsenal. He only makes reference to the Hospitaller arsenal, failing to specify whether the first one was an extension of the medieval one or if the Knights Hospitaller indulged in the building of a new one. More importantly, Rossi avoided giving the exact location of the first arsenal of the Order, which I am claiming must have been the same that existed in Birgu in 1530. According to Rossi, the arsenal was situated near the church of St Laurence³⁹. For his research, Rossi made use of the so called library manuscript, AOM 286⁴⁰, which contains a copy of the decisions taken by the Hospitaller Chapter General of 1539. However, the manuscript quoted contains the same information that can be found in Library Manuscript AOM 297⁴¹. Unfortunately, this document does not make reference to the site of the arsenal but only speaks about the setting up of a new *tercinale*. The recent research undertaken by Professors Fiorini and Wettinger towards the publication of medieval resource material in my opinion indicates the exact site where the arsenal was situated in Birgu. The idea put forward by Zabarella⁴² first and Professor Victor Mallia Milanes⁴³ afterwards, namely that the Hospitaller arsenal was on the quay

38. A(rchivio) (di) S(tato) P(alermo) R(egia) C(ancelleria), 159 f. 211v-212.

39. C. Sanminiatielli Zabarella, *Lo Assedio di Malta 18 Maggio - 8 Settembre 1565* (Turin, 1902), p. 169.

40. AOM 286, f. 89.

41. AOM 297, *Liber Capitulorum Generalium 1526-1548*, f. 80r.

42. E. Rossi, *Storia della marina dell'Ordine di S. Giovanni di Gerusalemme di Rodi e di Malta* (Rome-Milan, 1926), p. 103.

43. V. Mallia Milanes, "The Birgu Phase of Hospitaller History" *Birgu A Maltese Maritime City*, L. Bugeja, M. Buhagiar and S. Fiorni (eds), Vol. 1 (Malta, 1993), p. 80.

of Birgu (or as the place latter came to be known the *molo di San Lorenzo*, after the church dedicated to this saint situated there), is correct. But the site of this arsenal was not the same as that occupied by the Hospitaller galley arsenal. As I shall be explaining in this paper, the medieval arsenal could not be located anywhere else except in this part of town, just a few metres away from the new Hospitaller Galley arsenal.

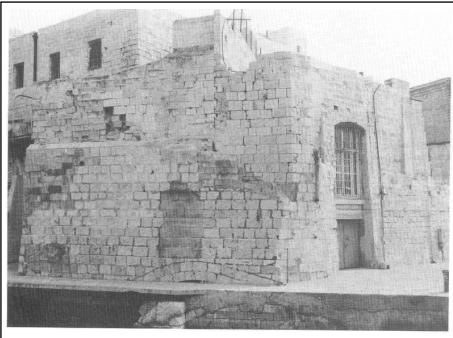


Fig. 1. Part of the area indicated as the site of the medieval ship-shed.

The documents of 1478 and of 1501–1503 (which refer to the work on the boundary wall and on the gate and stone quarrying of the arsenal respectively) have, on the same page, references to work undertaken on the castle which was situated at the point of the Birgu peninsula. It should be noted that this castle fell under the jurisdiction of the Castellan. At this particular period, the government of Malta came under two separate authorities and each authority held its own territories over which it enjoyed jurisdiction. The local notables held their seat of government at Mdina and their jurisdiction or *Universitas* covered the whole of the island, except for Birgu and its environs. The castle by the sea at Birgu did not fall under the Mdina authority. Gozo also had its separate government or *Universitas*. The Castellan who was at the helm of the Birgu-based government received his instructions from the heart of the Aragonese Empire, through the viceroy of Sicily. The document under discussion here seems to imply that the arsenal fell directly under the Castellan's authority.

The 1387 document explicitly spells out that the ship-shed fell under the jurisdiction of the Royal Curia of Palermo. The other references to the medieval ship-shed found in the documents of 1478, 1501, 1502 and 1503 always speak of a shipyard in relation to St Angelo castle. In

fact, the reference to the ship-shed and arsenal are either in the same act, as was the case with the 1478 reference, or on the same page of the document. This is a further indication that these two buildings were situated next to each other, and that the arsenal was just underneath the castle. The final proof of this fact is given by the 1478 document, which gives the exact location of the medieval arsenal in Birgu, as the document speaks about *loco di darsanali in buca di portu et a la tagliata in unu muru*, or the repair of a common wall that separated the ship-shed from the ditch at the mouth of the creek, clearly showing that the shed was at the tip of Birgu peninsula, next to the *tagliata*⁴⁴.

However, since we lack adequate historical information, we cannot be sure whether the site of the arsenal changed over the centuries. The identification of the site of the medieval arsenal under the castle-by-the-sea is also a conjecture. No doubt, the early structures referred to in the documents dated 1374 and 1478 indicate that Malta had a *tarsena*, but there is no indication of whether it was a fully-equipped arsenal. One also needs to take into consideration whether the 1501 and 1502 references to work on this ship-shed could be interpreted as the period of transition from a ship-shed into an arsenal.

If the early structure was indeed a ship-shed, it is more likely and logical that it was situated along the Birgu quay. The suggestion made above, that this arsenal fell under the jurisdiction of the Castellan, is strengthened by the fact that in those days military structures – and if an arsenal was being developed it must have assumed military functions – fell under the direct responsibility of the Castellan. Thus, the above identification of the area of the arsenal needs also to be corroborated by other sources.

Irrespective of the 1478 geographical references, one of the most plausible hypotheses concerning the area occupied by the medieval arsenal was that part of the quay next to the so-called *tagliata* or ditch separated the castle-by-the-sea from the rest of Birgu. The ditch or *tagliata* was already in existence in Birgu before 1450⁴⁵.

44. Wettinger (Palermo, 1993), p. 675.

45. C. Dalli, "Medieval Communal Organisation in an Insular Context", *The Making and Unmaking of the Maltese Universitas*, Supplement of Heritage (Malta, 1993), p. 10.

This ditch, which still exists today, leads to the sea. The area of the ditch is deep enough to allow small boats to anchor within it. In the past, exactly next to the *tagliata*, a successive number of stores or warehouses were situated. In fact, pre-war photographs give a clear image of these buildings, including the first store next to the ditch or *tagliata*. The origins of these stores can be linked to this medieval arsenal. They were built on the same place and area where the old structures of the arsenal were situated, serving as depots for material used, for instance, in the repair of boats and ships. From an in-depth urban analysis of this area one can actually uphold this theory. Furthermore, it can also be supported by documentary evidence.

We know that in the Middle Ages the arsenals were built either in the shelter of the city walls or under the protection of a castle. Due to the fact that the suburb of Birgu was not fortified in the Middle Ages and its sole protection came from the castle at the tip of the peninsula, the arsenal could only be constructed close to this fort. For military and strategic reasons, the entire area in front of castles and other fortifications were left free of any construction. Buildings were only permitted at a certain distance away from the outer walls of the fortification. This policy was also observed in Birgu. As can be seen in medieval documentation, the hinterland in respect of St Angelo Fort was left free and unencumbered, to the extent that at the turn of the sixteenth century medieval notarial documents refer to the presence of fields in this locality⁴⁶.

Therefore, if there was an arsenal in Birgu, this could only have been very close to the castle, and possibly, just underneath this fort so that the area of defence in front of the castle would be kept free and unencumbered as much as possible. For this reason, the arsenal would usually be constructed in wood rather than stone, so that the structure could be easily dismantled in case of attack, while the material could be re-utilized for the defence of the castle.

Just five years before the arrival of the Knights, that is in 1525, part of the fortifying wall of Fort St Angelo fell bringing the Fort administrator or Castellan and the town councillors (*jurati*) to uphold an important

46. Wettinger (Malta, 1993), p. 62.

decision on Monday 30 October 1525, of the 14 indiction, to have this wall rebuilt. However, before the rebuilding could take place, the Castellan and councillors had to specify that the area had to be cleaned of debris. Moreover, they specify that the new wall, which had caved in, was situated between the royal castle overlooking the arsenal from the south direction⁴⁷. In other words, the castle and the arsenal were situated next to each other and part of the castle fortifications overlooked the arsenal.

Matteo Perez D'Aleccio, the painter commissioned by the Knights to record scenes of the Great Siege during the Turks' three-month siege of Malta between May and September 1565, can also confirm that the area was occupied by this arsenal on the quay of Birgu. Perez D'Aleccio depicts one of the big ships of the sixteenth century, the grand galleon, anchored next to Birgu's quay⁴⁸, exactly in the area where the old arsenal is here claimed as having been situated. This image could demonstrate that:

1. on this site there was both the medieval arsenal and Hospitaller arsenal;
2. this side had a deep-sea quay which permitted the berthing of ships;
3. on this side of the harbour ship repair was taking place, as normally repairs on floating vessels were undertaken while the hull was in water, and for practical and strategic reasons the ship was berthed next to the arsenal;
4. as suggested in the previous claim, in this period the area in front of the arsenal was also deep enough to permit a big ship to anchor; thus the area in front of the arsenal was deep enough for launching or berthing of other type of vessels in use during this period.

Photographs of the buildings on the Birgu quay taken prior to the war or just immediately afterwards can be helpful in giving us an idea of the size of the arsenal that existed in this area, as well as an indication of whether there was a change in the structure of this building from a wooden to a stone ceiling. Such old photos show that the building in

47. Cat. Arch. Misc 439, *Universitas*, No. 10, f. 7. "*Lunedì adi XXX Octobris Indictionis 14 1525 per ordinazioni di gli manifici castellano et jurati si avi incommenziato a nectari la fabbrica sive muro novamente caduto intro lo regio castello predicto esistenti super darsena alla manda di mezzo giorno*".

48. L. Maiorano, *Matteo Perez D'Aleccio Pittore Ufficiale del Grande Assedio di Malta* (Lupoedizioni, 2000), p. 72.

this area was quite old and dates to the sixteenth or early seventeenth century (but the former date seems to be more plausible). Judging from the stone-ribbed arches that used to hold the stone ceilings of the building in this area, the existent edifice can probably be dated to late medieval times or the early modern period. The most plausible date is the early sixteenth century, since this type of ribbed arch is indicative of late medieval architectural design.

One of the photographs shows the building which stood until recently in the area, which is being regarded in this article as having been the place which used to host the old medieval arsenal. It had the façade of a small fort, flanked by an arched store. This building eventually had its function changed and after a new galley arsenal was built on the same quay, it was transformed to house the slaves' prison building. One is tempted to think that such a building was a continuation or enhancement of the structure that was used as the shed of the Birgu arsenal. Due to its military nature and its complex architectural features, it was not pulled down but was considered to have sound and strong buttressing walls, in particular after it was turned into a closed pen. This meant that the building could be transformed into the premises where the galley slaves could be locked during the night.

The building's surrounding perimeter made it the ideal place for modification into a prison for slaves upon the Knights of St John's arrival in Malta in 1530. Photographs of this site give the idea that its walls could have been built on the perimeters of the walls of the medieval ship-shed. The other theory is that this ceiling was part of the new arsenal built by the Knights, or else it could have been put up during the early sixteenth century. Whatever the case, if this ceiling had served in the past as a roof of the arsenal, it then represents the transformation of this area from a ship-shed to an arsenal. According to some of the photographs, the stone-ribbed arches were holding a stone ceiling but this cannot exclude the possibility – even if very remote – that such arches could have held in place planks of wood. In other words, at some point during the first half of the sixteenth century this arsenal, which originally consisted of one shed, was enclosed by a strong buttressing wall made of stone. The latter wall supported ribbed arches which were eventually covered by a stone ceiling. What seems certain is that the medieval arsenal

comprised one warehouse and that its ceiling was at first made of wood, but later changes made it possible for this medieval arsenal to have a stone ceiling, which seemed to have rested on stone-ribbed arches.

From the above description one can picture with some accuracy the interior size of the arsenal during the first half of the sixteenth century. This rectangular shed remained in existence and in use in the first years of the Order in Malta. It is known that the shed at the time of the Knights was the length of a galley. Thus, it was approximately 144 feet in length, the average size of a galley used in Malta at that time. As no records survive regarding any works on the arsenal during the time of the Knights, in particular whether or not it was enlarged, one has to assume that the length was the same for this arsenal during late medieval times. Giacomo Bosio, in his detailed history, refers to the arsenal but does not mention any repairs or major extensions that may have taken place, except that in 1535 a galley was launched that had been completely built on the island⁴⁹. Presumably at this arsenal and immediately afterwards, they began the construction of a new one⁵⁰. Thus the approximate size indicated above of a galley can be taken as being the size of this medieval ship-shed in the 1530s.

Moreover, it was the norm for military arsenals to be the length of a galley. To mention a classic example, the size of the arsenal of Venice was based and calculated on the size of the so-called *galere grosse*, or big galleys.

Fig. 2. The area of the medieval ship-shed as it appeared during the Second World War.



49. Bosio, p. 140.

50. *Ibid.*

This description continues to confirm what old photographic images suggest – that the old arsenal consisted of one shed, was situated in the shadow of Fort St Angelo, and had the space to accommodate a galley.

Geographical Position and Sea Erosion

A characteristic problem typical of arsenals was the damage sustained by exposure to the elements, particularly because of the seafront location. It is recorded that both the Genoese and Amalfi arsenals were badly affected by storms. The arsenals were occasionally flooded and strong seas could even ruin parts of the building, destroying stone arches.

Thus the choice of location for the Maltese medieval ship-shed was not an arbitrary one but the result of a number of considerations, in particular environmental factors. Unlike Amalfi and Genoa, Birgu's harbour entrance did not overlook the open sea. The Maltese harbour is renowned for its protective inlets. The entrance to the harbour faces south-east and has a very protected entrance. Damage could only be caused by what in Maltese is known as a *grigalata*, or a north-easterly storm.

The Grand Harbour has five inlets, which today are known as Rinella Creek, English Port (the entrance leading to Birgu which the village of Kalkara overlooks), Galley Creek (between Birgu and Senglea), French Port (the entrance between Senglea and Corradino Hill) and finally Corradino Creek. On the other side stood the peninsula on which eventually the city of Valletta would be built.

Thus the ship-shed was built in a naturally protected area. One of Birgu's two quays faces north, that is towards the entrance to the harbour; the other faces south, towards the inner side. It was on this latter quay that the arsenal was built. Thus it was very sheltered.

However, despite this natural protection, the ship-shed needed constant maintenance. Irrespective of its location, the arsenal was situated on a quay in front of the sea, and was destined to suffer from sea erosion. Some precautions were taken to reduce this problem as much as possible, in particular damage to the wooden structures which, being of organic material, suffered natural decay and required skilled maintenance. For example, the wooden beams of the arsenals used to be coated with *malto*, or a resin and tar mixture, so that the wood could

withstand sea erosion⁵¹. In other words, the wooden roofs had to receive the same treatment reserved for the ships. Until now no records have been encountered concerning the importation of tar. However, there is an indirect record of the individuals who used to carry out such work, that is, the caulkers. The Italian word *calfato* or caulker appears in medieval documentation as a surname⁵². Part of the caulkers' work was to immerse the oakum in tar for the caulking of wood.

The second consideration was the site chosen for this ship-shed. The sea is very deep in this area, allowing big ships to sail close to the shore. This is also corroborated by one of Perez D'Aleccio's siege paintings, as indicated above. The third consideration was a military one. The arsenal was a military facility. It needed protection and Birgu was the only place that could offer it through its fortified castle.

The next point to be taken into consideration is the orientation of the slipway. The new galley arsenal had its slipways constructed at an angle, slanting slightly in relation with the quay towards the mouth of the so called *Porto delle Galere* or entrance to the inlet between Birgu and Senglea. In other words, it was not built at 90 degrees, with its mouth facing Senglea, but was oriented at a slant towards the entrance of the inlet, overlooking Valletta. The reason for this orientation was to avoid the risk of having the galley or boat, after launching, crash onto Senglea's quay. One needs to remember that the big force and momentum generated by the large vessels as they slid into the water raised the risk of collision with the opposite quay of Senglea. This consideration makes one wonder what the old slipway of the medieval arsenal looked like. Did it face the Senglea peninsula at a 90 degree angle, or was it positioned at a slant towards the north or south of the Birgu peninsula? Taking the geomorphology of the area, with a situation where the Senglea peninsula was longer than Birgu, whilst Fort St Angelo jutted out at the tip of the peninsula, one seriously doubts whether the mouth of the medieval slipway looked outwards, towards Valletta⁵³. If the slipway faced the mouth of the Galley Port, then the orientation

51. NLM Libr. 223, subvoce - rasa per la spalmatore; subvoce - resina.

52. G. Wettinger, "Distribution of Surnames in Malta in 1419 and the 1480s", *Journal of Maltese Studies*, no. 5, 1968, p. 34.

53. Muscat (Malta, 2001), p. 6.

of the slipway had to be sited in a way that once a ship was launched, it by-passed the jutting rocky circumference of the fort, as well as the tip of Senglea's peninsula. Another option was for the slipway to look towards the inner side of the inlet. Birgu quay, looking southwards, offered a natural support as it was slanted inward. At the same time, the inlet is deep enough to allow for the launching of a small ship or medium-sized boat (providing the slipway has an inclination of about 8 degrees) without any risk of crashing onto Senglea's jetty. However, such a position also had its disadvantages as it did not allow for the launching of big ships. This disadvantage could be one of the reasons why the Hospitaller Knights decided to abandon this area for a new one in the inner side of the quay, which permitted a better orientation for the launching of ships.

The choice of Birgu for this ship-shed follows the general geographical trend normally found in the Mediterranean. Ship-sheds are found both in ports of call and outposts. The town of Birgu qualified as both. It was the sole port of call existing in Malta during the late medieval period. However, unlike other ports in the Mediterranean, its importance was rather limited, in the sense that at this period the Maltese harbour was outside the main trade routes, not least those of Venice. It was mostly important for Genoese shipping, or else as a military outpost. It is also a historical fact that ports of call in the Mediterranean had the best and most developed arsenal facilities. The fact that Malta was still not an important port explains why its medieval arsenal was not so important and had very limited functions.

With the arrival of the Knights of St John, the harbour of Malta became an important port of call and the new rulers felt the need to develop a new arsenal by constructing a modern and larger galley arsenal, which was also built on the quay of Birgu. Being the only outpost in Malta during the said period, with a navigational opening onto the sea, Birgu became a small naval base, offering temporary refuge to naval vessels. These were two other characteristics which are normally associated with Mediterranean ship-sheds and linked to outposts.

Offering natural protection to the Maltese arsenal, Birgu's geography allowed it to dispense with protective measures at its entrance for a number of decades, if not centuries. It is recorded that in medieval times,

the presence of a large chain existed in various arsenals. The Arabic geographer, Ibn Hawqal, records the presence of such a protective chain structure in connection with the city and arsenal of Palermo. This form of defence in Palermo is vividly recalled, and according to Professor Jeremy Jones, the church of *Santa Maria della Catena* (St Mary of the Chain) is linked to this protective measure. The church is situated at one end from where the chain was secured. A similar chain at its entrance also protected the arsenal of Genoa.

It was only in the middle of the sixteenth century that the need for a protective chain began to be felt in Malta. The chain was needed to protect the inland sea between the Birgu peninsula and the opposite peninsula known as Senglea. When this chain was introduced in Malta it was secured at the entrance to Birgu and if one is to uphold the theory that the Maltese medieval ship-shed was situated just next to Fort St Angelo, immediately behind the *tagliata* or ditch, then the chain was probably secured at the outer end of the arsenal across the sea up to the Senglea peninsula.

The need to have this entrance to the Maltese harbour protected by a chain, which was eventually brought from Venice, arose in the middle of the sixteenth century due to the fear of a Turkish assault. Illustrations of this chain can help us understand how it was constructed. Jeremy Jones suggests that it was well-nigh impossible for a chain to be made totally out of iron if it was to resist the upthrust of the seawater as well as withstand water currents and gravity. A long iron chain, irrespective of the amount of iron used, would snap due to the pressure of gravity pulling on the centre of the chain. Thus wooden pylons were needed as support.⁵⁴

Matteo Perez D'Aleccio throws light on this in one of his paintings of the Great Siege, in which he depicted this type of chain at the entrance to Birgu's creek. On close inspection of Perez d'Aleccio's painting, it is clear that such a chain had a number of wooden buoys to support the upthrust of this heavy metal structure in water, in order for it not to break due to gravitational forces. The wooden buoys were strong enough to resist any assault on the chain from enemy forces.

54. Maiorano, p. 72.

These forms of fortifications and protection units were common features of late medieval arsenals. Whilst the Arabic arsenal of Palermo had a protective chain, the medieval arsenals of Pisa, Alanja and Genoa were built in protected and sheltered areas. They were situated either next to a castle or had fortification towers constructed for the purpose of defence. It was normal for medieval arsenals, such as the one of Pisa, Alanja and Genoa, to have the former type of fortifications. The Pisa arsenal had one defence tower; that of Genoa two. The arsenals of Genoa, Pisa and to certain extent that of Venice were built at the outskirts of the inhabited areas or at the parameters of the urban core. This is why the arsenal of Pisa is found in the periphery of the town overlooking the Arno river. The ones at Venice, Genoa and Alanja were also built at the outskirts of the inhabited core, directly overlooking the open sea. The one at Birgu, too, was in the outskirts of the inhabited core. The area behind the arsenal was still an open space in late medieval times. The fundamental issue was that of defence. In fact, the need for defensive fortifications was a priority for all the above discussed arsenals. This turned the place of the arsenal from a peripheral area (in respect to the built-up area) into a strategic location, around which urban development would eventually take place. In Malta, the area around the arsenal was built up in the sixteenth century. In itself, such a development can be another indication that it was in this period that the Birgu arsenal became truly an arsenal (and not just a ship-shed as it was before).

The Characteristics of the Maltese Medieval Ship-Shed

The fact that an arsenal is mentioned as having existed in Birgu suggests that the area in front of the arsenal should have had the following characteristics which are generally found in all late medieval arsenals but also in those built in Greek and Roman times:

- a. a good supportive bedrock;
- b. a slipway leading straight to the water;
- c. a slipway made from sleepers embedded in the bedrock at regular intervals;
- d. a sufficiently high wooden ground way;
- e. a supportive cradle on which the keel could rest to allow the vessel to slip easily into the sea.

A geological analysis of the bedrock of the Birgu quay shows that it was strong enough to support the necessary structure of an arsenal. The quality of the rock in the area is globigerina limestone, known in Maltese as *tal-franka*. It is a soft stone, which can easily be quarried or dug up and at the same time weathers nicely. Thus, once it ages, it resists erosion. The slipway of the medieval ship could be easily rock-cut. One can therefore rightly conclude that the Birgu arsenal fulfilled the first condition. No direct reference has survived regarding the existence of a wooden ground way, but the specific documented reference to an arsenal automatically implies the existence of such a structure.

The third point revolves round the slipway of the shipyard, which should have led directly to the sea; the existence of such a cradle is recorded in the new arsenal of the galleys built by the Knights around the 1540s. Reference to the measurement of the gradient of this arsenal galley has survived: it measured $1/8$ or 7.1 degrees. Unfortunately, any reference to the measurements of the medieval arsenal is lost. These measurements could have helped us understand the size of this arsenal as well as the type of boats that used to be built or repaired there. However, the gradient should have been within the same parameters as that of the galley arsenal. Studies carried out on arsenals dating back to classical times (and discussed during the conference at Ravello) produced a gradient for their cradle which it would be interesting at this point to reproduce. These measurements could help the reader to understand the range of gradients that would have existed for the Maltese medieval arsenal. The following are gradients of arsenals existing at the time of ancient Greece: Marseilles' arsenal had a gradient of $1/19$ or 3.01 degrees; at the Apello ship-shed, it was $1/14$ or 4.1 degrees, at Carthage $1/10$ or 5.7 degrees, at Kition $1/9.5$ or 6 degrees and at the arsenal of Zea, it was $1/7$ or 8.1 degrees. It goes without saying that these types of gradients in these ancient ship-sheds were conditioned by the type and size of ships built on these sites.

Based on these studies and taking into consideration the type of ships that could have been built in the Maltese arsenal and the work of a number of scholars on the size of the gradient of late medieval slipways,⁵⁵

55. Muscat (Malta, 1993), p. 262.

together with the size of the medium-size boats recorded as having been built at this arsenal, the gradient of the Maltese ship-shed should have been in the range of $1/8$ or 7.1 degrees.

Further analysis of existing ship-sheds and arsenals shows that the gradient was not constructed haphazardly but after careful calculation. A haphazardly built slipway could be dangerous and cause damage during the vessel's descent from the arsenal into the water.

At this stage, it should be noted that the tradition in Malta of fixing wooden beams along the slipway, usually at a distance of one metre from each other, is very old. It certainly existed when the galley arsenal was built by the Order. Similar structures were definitely present in the slipway of the medieval arsenal at Birgu. This system of wooden beams was present in slipways built during the classical age. From studies conducted on Mediterranean ship-sheds, before a big boat was launched these beams along the slipway were greased to avoid friction. Friction could cause the boat to come to a halt as it was being lowered. Once a big boat got stuck in the middle of the slipway, it was very difficult to force it to move. Moreover, if this occurred suddenly, the boat could keel over. Therefore, various arsenals used a sledge to facilitate launching a ship from the shed into the water. The cradle (or the wooden beams along the slipway) would have a form of a channel to aid the ship to keep moving straight into the water. Judging from remaining structures of old cradles and the still prevailing tradition in Malta, the preferred system, at least for the past hundred years or so, is to have a form of a channel in the middle of the cradle. On the basis of this tradition, one may safely conclude that this system was also in use in the medieval arsenal of Birgu.

Thus, whenever a boat was launched the utmost stability was required. Other measures came into play, such as struts which were used to keep the boat in a stationary position. The cradle had keel slots, so that the boat could be stopped at the water's edge. These methods are still in use today in Malta with regard to medium-sized boats as they are not totally pulled out of the water but stopped at an angle along the slipway and are eventually tied at the slipway by the bill, a form of anchor-fluke.

From the above one gathers that the Maltese medieval ship-shed had a good launching structure or slipway. One has to remember that in the life of a medium-sized or big ship, the launching was the most hazardous

phase. The question that every shipwright asked himself was: What would happen to the hull as it entered the water? The possibilities for damage involved four scenarios: (a) the ship could suffer structural failure resulting from the impact of the hull with the water (b) it could capsize; (c) it could get flooded or, as already mentioned, (d) it could get stuck on the slipway. Thus the gradient of the slipway was very important as it lessened the risk of any of these four possibilities happening.

The existing medieval documentation does not make any reference to the slipway but at least one of the documents already mentioned above, that of the Regia Cancelleria of Palermo, supports my argument (if ever there was a need for such an obvious fact) that the Maltese ship-shed had a slipway.

Relevant to this point is the fact that it seems in 1484 trouble was brewing between the vice-admiral in Malta, Carlo Deguivara, under whose responsibility the arsenal seems to have fallen, and a local ship owner and corsair, Giovanne De Nava. The latter had built a *fusta* for corsairing activity. It appears from this document of the Regia Cancelleria that this boat was built in Malta. According to De Nava, the vice-admiral Deguivara was putting spokes in the wheel to stop De Nava from both launching and equipping this boat for corsairing activity. The Royal Chancery had given credit to De Nava, as in 1486 it wrote to their vice-admiral in Malta Carlo Deguivara to instruct him not to interfere or in any way stop Giovanne de Nava from launching and equipping his *fusta* for corsairing activity against “infidels”⁵⁶. The fact that this document contains a reference to the launching of a boat provides a proof for the existence of a slipway at this medieval ship-shed.

Birgu and the Galley Arsenal

In 1530, the Order of the Knights of Saint John adopted the islands of Malta as their new home. The option to come to Malta appears a less than ideal choice. From the Order's viewpoint, the island lacked everything, from water to culture. However their choice was prompted by one important factor; the island possessed one of the best harbours

56. ASP RC 159, f. 211v-212.

in the Mediterranean. Until then, none of the powers in the region had seriously taken into consideration its possibilities.

This whole area constituted the zone which rightly became known as the Grand Harbour because of its expanse and its depth. Maritime considerations were important factors for the Knights. During their sojourn in Rhodes, they had developed a strong fleet. When, in 1522, their time came to leave their Christian enclave in the East of the Mediterranean, they had sixty ships, including two carracks. It was due to the existence of such a fleet that, when the Knights eventually accepted Malta, they chose as their first place of residence a zone in the Grand Harbour, and went to live in a place which had urban aspects, namely Birgu. One must not forget that the medieval ship-shed already existed and this definitely must have influenced their choice. What is historically certain is the fact that the Knights immediately showed interest in Birgu as a place where to set up their administrative structures as well as the place in which to shelter the fleet.

The entrance of the inlet of Dockyard Creek in Birgu offered natural protection to the Hospitaller fleet. This area was generally sheltered even in winter. The only problem was that the Maltese harbour was open to the north-easterly gales, as the entrance to the Grand Harbour faced the strong northeast winds. The entrance to Birgu was considered ideal for harbouring the fleet in winter, as it was again sheltered from these winds, with the Birgu Peninsula offering a natural breakwater against gale-force winds. During the period when the ships were in harbour, between the end of October and the beginning of May, the repairs and caulking of ships took place.

During the first ten years, the Knights of St John made use of the medieval arsenal for the repair of their fleet. Even if one considers that some sort of modification had taken place at this arsenal to better meet the requirements of the Hospitaller galleys, it goes without saying that the pressure of work at this arsenal must have increased tremendously with the arrival of the Knights. However, as it is reported that a galley was built in Malta during the first ten years of the Order's sojourn, one strongly suspects that either this arsenal was extended or else it was suitable to take a galley. For these reasons I am tempted to think that this medieval arsenal's length was that of a galley. Thus, the structure of

this arsenal remained, at first, the same as in the late Middle Ages; consisting of one 'gabled shed with the whole structure being made of wood' and with the width of this whole structure not exceeding 25 meters. What is certain is the fact that, in 1535, this arsenal had a length equivalent to that a galley, due to the fact that in that same year construction on a new galley began that was completed the next year. The work must have been finished to the Grand Master's great satisfaction for immediately the order was placed for a new galley to be built.

However, it was not long before the need was felt to build a new arsenal. In 1539, the Chapter General of the Order met to discuss the choice of the site. The meeting was held on 21 March 1538 *ab incarnazione*⁵⁷, which according to our calendar with be 1539. The aim of the Hospitaller Council was to have a *tercenalis* which would be used for the building of Hospitaller ships, but it also had to be equipped with storage space for ammunitions and maritime supplies. There is no doubt that the old arsenal lacked sufficient space to meet all these military and naval requirements. Judging from Bosio's *Historia*, the actual works began in 1540⁵⁸. Again, according to Giacomo Bosio, the Order's historian, the arsenal was nearly constructed "in the middle of the road of the marina of the Borgo"⁵⁹. In brief, this new site was probably to be found exactly where today there stands the Maritime Museum. If this is correct, then the choice of this site was decisive insofar as throughout the Order's period until 1798 the arsenal of the galleys in Birgu never changed locality. Indeed, it would always remain on this new site.

The building of the new arsenal was completed in a rather short period of time. By the year 1543, the new arsenal was already a point of reference and is found being used by notary Brandano Caxaro to describe the place of location of houses in one of his notarial deeds. Caxaro's deed indicates that on that year Birgu had only one arsenal – and not two – and that this arsenal was situated on the quay, surrounded by town dwellings. In fact, Caxaro speaks about houses situated "in the Maltese Suburb-by-the-Sea (which is another name for Birgu) to be found

57. AOM 297, *Liber Capitulorum Generalium 1526–1548*. f. 80r.

58. Bosio, Vol. 3 (Naples, 1684), p. 184.

59. Eadem.

on the quayside next to the *terzanale*⁶⁰. The position of the arsenal at the centre of Birgu quay can also be confirmed by the expropriation of a number of properties on that quay to make space for this arsenal and its eventual expansion. At the same time, with this new building, the Knights were careful not to obstruct the church of St Lawrence in Birgu, which during the Order's first years in Malta they used as their Conventual Church.

The question would now be about the old medieval arsenal. What had happened to this building? It seems that by 1543, it had already fallen into oblivion or better still had its function changed either to a store or turned into a prison for the galley slaves. The latter would be the eventual destination of this place. This was a natural choice, as in the first decades of the Order's rule, the Hospitaller slaves were kept in a building in the precincts of Fort St Angelo, in subterranean cells or pits known by the Italian word of *cuve* and built in 1531 by Grand Master L'Isle Adam⁶¹.

What is certain is that the medieval arsenal is not the same as that built by the Knights on the Birgu quay. This further strengthens the argument that today's Maritime Museum was the Hospitaller's new arsenal that well fits the description given by Giacomo Bosio.

Thus, for the first ten years of their stay in Malta, the Knights continued to use the medieval arsenal for their daily maritime requirements. On their part, the fact that the Knights began immediately to consider building a new one shows the importance they lent to the fleet. One has to remember that the first thirty years of the Order's stay in Malta was marked by great inertia. Many Knights were of the opinion that their stay in Malta was temporary and that it was better for the Order to leave the island at the first opportune moment, and if they succeeded, as they always dreamt, return to Rhodes, which they had lost to the Ottoman Turks in 1522. The situation was such that the Knights initiated few important projects in Malta during the first half of the sixteenth century, and this included also aspects of defence.

60. Notarial Archives Valletta, R. 175/Vol. 11 Fol. 413. "*quondam loco domorum situ . . . in suburbio maris Melitae secus litus maris de apud terzanale - 11 April 1543*".

61. G. Wettinger, *Slavery in the Islands of Malta and Gozo, ca. 1000-1812* (Malta, 2002), p. 85.

It was only in 1551, after the squadron of the Muslim corsair, Turgut Rais, known as Dragut, invaded the islands, and following other serious mishaps linked to this invasion, that the Knights began to seriously consider fortifying the island of Malta. In fact, as a result of Dragut's raid, the entire population of Gozo, Malta's sister island, was taken into slavery. After this victory, Dragut's forces moved against the fortress of Tripoli, which belonged to the Knights. It was subjected to a siege and forced to capitulate. The Birgu arsenal can be considered as the only exception to the inertia described above in terms of military planning for the island of Malta. Its renovation began eleven years before the military disasters of 1551.

The new arsenal of the Knights' galley was built in 1540, and at first, like the medieval arsenal, consisted of one shed. However, this arsenal was constructed with stone arches, whilst the gabled roof was covered with wood. It was constructed on a different part of the quay, very near to the church of St Lawrence. The work was completed in a short time. In 1554, the first galley, the *Capitana Santa Maria della Vittoria*, was launched from this arsenal. After the siege, more modifications were undertaken. The structure underwent a revolutionary change. A new shed was introduced, whilst the roofs of both sheds ceased to be made of wood. Thus, in 1597, the Grand Master and Council appointed the Bailiff di Santa Eufemia, Centorio Cagnolo, the Admiral Petro della Rocca and the Bailiff of Negroponte Raimondo Forturisi together with the Lieutenant Grand Master Raimondo Degozon Melac to take the necessary steps for the construction of a new naval arsenal.⁶² The one in Birgu needed a general rehaul, and was encumbered by an old and derelict galley *capitana*. The Common Treasury was authorised to dispose of this old, inoperative ship⁶³. In 1607, the Order felt once again the need to enlarge the arsenal. Commander Agostino Mego donated to the Order two big adjacent houses, situated in the *contrada* known as *Malcantoni* in Birgu. In turn, these houses were next to the arsenal building. Such a donation made the enlargement of the arsenal possible. The donation was sealed by

62. AOM 100, *Libro Conciliorum 1597-1603*, f. 6v.

63. *Ibid.*

a notarial act of Nicola Murgano dated 6 September 1607⁶⁴. Work continued in the following decades and on 1 October 1636, the Hospitaller Knights' Grand Council approved the building of a new arched shed for the Birgu arsenal. The Prior of Toulouse, Fra Da Muis, and the Commander Fra Antonio Scalamonte pledged two hundred *scudi* each for the construction of this new archway⁶⁵. Then, on 20 September 1696, the Order's Venerable Council approved the extension of the arsenal, thus permitting the addition of the third and last arch to the Birgu galley arsenal. In the following year, that is on 22 April 1697, the Common Treasury issued a decree regarding the reallocation of the wood dismantled from the Birgu arsenal to be used on the construction of a shed in Valletta at the place known as the *Calcara Vecchia*⁶⁶.

Unfortunately, the site which has been identified in this paper as the one used to house the old arsenal was recently pulled down to make space for the building of a block of modern flats. This building was deemed of no historical value by the local authority regulating planning and construction permits (MEPA).

At this point, it is important that the reader keeps in mind that until this area was pulled down there were two separate buildings between the *tagliata* or ditch of Fort St Angelo and the building known as Caraffa stores. The latter has until now escaped total destruction. The whole area in between was taken over by the said block of flats. Previously, there was a form of a fortified building (which served as the entrance to the slaves' prison) and next to it stood an arched shed that was used during the British era as the Protestant chapel. One has to add that the British made alterations to this building. Due to the damage during the Second War World and recent and misguided demolition works in this area, the exact identification of the architectural remains at this medieval arsenal can only be conjectured or reconstructed by those possessing good photos of this area.

64. AOM 456, *Registrum Bullarum 1607–1609*, f. 258v–260r.

65. AOM 111, *Libri Conciliorum 1636–1639*, f. 258r.

66. AOM 647, *Registro Decreti Camera del Tesoro 1697–1706*, f. 9v.

Conclusion

In the light of the above study, it would be better if, when writing about Malta's maritime history, scholars were to speak in terms of a ship-shed rather than an arsenal in late medieval Malta, as the former term better reflects the maritime structure existing in Birgu for the repair and sheltering of ships. A true arsenal came about in the sixteenth century either a few years before the arrival of the Knights or in the first decade of the Knights' stay in Malta. Whatever the case, the arrival of the Knights made a fully fledged arsenal imperative. They needed a fully operative and functioning place which could accommodate different ships, and an arsenal where to build their galleys. It was also with the arrival of the Knights that the Birgu quay became a hub of activity, with the stores in the area being totally dedicated to the support of the Hospitallers' maritime squadron. As a result of the Knights' arrival in Malta, the area around Birgu was destined for a drastic change. The quay was at the centre of this urban transformation. It was turned into the core of Birgu's urban life. The operation and functioning of the arsenal became a complex business. It ceased to focus only on repairs and maintenance of ships but diversified into galley building. Even the architectural configuration of the stores – some of which dated before the time of the Knights – was either modified or built anew to accommodate the different types of ships in the Hospitallers' fleet.



Fig. 3. The area as it appeared after the Second World War.

Without doubt, from the 1530s onwards, one cannot speak any more of open or closed ship-sheds in Malta or a medieval type of *tarsena*, but of a fully-fledged arsenal, well-roofed and covered by a stone ceiling.

Over the years, the area that I strongly believe to have been the site of the first Maltese arsenal underwent a number of structural changes and conversions. The old ship-shed was, presumably, first converted into an arsenal but a few years later, transformations were undertaken to adapt the building for the construction of galleys. However, in less than a decade the Hospitallers realised that this new galley arsenal was not enough for their needs with the result that they opted to build a new galley arsenal on the same Birgu quay. This old arsenal was eventually transformed into a prison for galley slaves. It underwent further changes both to its structure as well as its use during the British era, but luckily escaped major structural changes to its internal features. Unfortunately, it suffered extensive damage to its façade during the Second World War, though it was only recently that this historic area failed entirely to withstand the test of time.

This building, which I consider to have been the site of the first ship-shed before the arrival of the Knights, resisted total destruction during the Great Siege of Malta by the Turks in 1565, when for three consecutive months the Ottoman Armada besieged Birgu, and in more recent times during the Second World War, when between 1939 and 1943 the area was heavily bombarded. However, as already indicated, this building failed to escape land speculation and construction. This building was obliterated with the full consent of the Maltese authorities with the excuse that it had no architectural or historic value! It is for this reason that I, as Director of the Mediterranean Institute at the University of Malta, felt the need to participate in this *Navigation du Savoir* project, in order to record and research our maritime past in an attempt to help prevent further onslaughts of this kind.