

Exhibition

The Art of Fortress Building in Hospitaller Malta

Stephen C. Spiteri

The religious and military Order of the Knights of St. John sought to affirm its destiny in stone. Its long military history can be said to have been moulded by ramparts of stone. Indeed, the one constant feature of the Hospitaller war machine throughout its long six hundred-year history was its heavy reliance on formidable strongholds and forts. In all the theatres of war in which the Order established its convent - the Latin East, Rhodes, and Malta - fortifications were the Order's prime instrument of war.

Without their fortified bases, the Knights would not have been able to take the war to their enemies, nor defend themselves from the heavy retaliatory blows that were sure to follow. The castles and fortresses of Syria and the Latin East such as Crac de Chevaliers, Marqab and Belvoir, together with the fortresses of Rhodes and the Dodecanese islands and the bastioned enceintes and towers of Malta all stand monument to the importance that the Hospitaller Knights assigned to the design and construction of their fortifications. Nowhere was this commitment to build fortresses, however, so manifestly evident as during the Maltese period of the Order's long military history. In the two-and-a-half centuries that the Knights occupied the Maltese islands, they transformed them from a barren outpost on the fringes of the European mainland, that was then a dependency of the Spanish crown, into a front line bulwark for all Christendom and one of the heaviest defended islands anywhere in the world - literally an island-fortress in the centre of the Mediterranean.

This prodigious fortress-building effort was made possible by the Order's singleminded purpose and the huge financial resources that the Knights were able to muster and funnel into their ambitious building programmes. Equally important was the Order's highly efficient form of government, run on a relatively stable constitution that had been developed and perfected very early in its formation and one that allowed it continuity and consistency in its actions. By the time of the arrival of the Order in Malta in 1530, the Hospitallers had acquired a long fortress-building tradition. Their administrative and organizational mechanism, geared towards perpetual warfare, had developed, over the centuries, into a highly efficient structure.

"The Art of Fortress Building in Hospitaller Malta" was an exhibition that drew attention to this unique building process. Organized by the National Library and myself with the assistance of the Fortress Explorer Society and the Superintendence of Cultural Heritage under the auspices of the International Institute of Baroque Studies, UOM, it focused on the issues that military engineers had to contend with in the implementation of fortress schemes, following the construction of a complex work of fortification throughout its many



stages and also examining the organization of the workforce, the workings of the fortification atelier, and the roles played by military engineers, commissioners, surveyors, draughtsmen, master-masons and the various skilled craftsmen and labourers.

A crucial aspect of this exhibition was how the Knights themselves and their contemporaries recorded this extensive building activity. The end product was a synthesis of contemporary engineers' and commissioners' reports, original architectural plans and maps, building contracts and 'appalti', minutes of the meetings of the Order's council and the Congregation of War and Fortification, testimonials, notarial deeds, and numerous *supplici* by master-masons, skilled craftsmen, and other individuals involved in the building industry. The story was also told by means of specially designed panels, detailed scale models of fortifications, building tools and replica instruments. (An online catalogue can be downloaded from www.fortress-explorer.org/exh_catal.html)

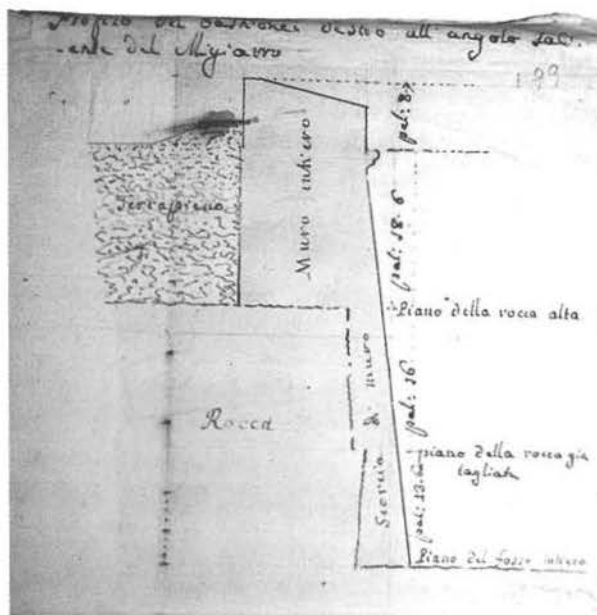
The art of fortification in the Maltese islands throughout the Order's rule was a complex and multifaceted activity that grew to impinge upon many aspects of the Knights' organizational, military, and technical capabilities. The numerous and ongoing schemes of fortification impressed themselves not only upon the Order itself but also, inevitably, upon Maltese society in general. The extent to which the whole fortification enterprise affected the Maltese milieu was considerable. Aside from the financial benefits derived from the large sums of money drawn from abroad, which filtered down into the economy in general, the fortification works provided wide employment, generating in the process a prosperous quarrying and building industry. On the other hand, the imposition of taxation and other financial burdens did lead to a growing sense of resentment among the inhabitants which, coupled with other long-standing grievances, eventually resulted in the downfall of the Order. But there is no denying the fact that the fortifications did provide the inhabitants with an increasing sense of security, especially from 1566 onwards. At no time in their past history had the Maltese inhabitants been so well protected against invasion

and predatory piratical raids as they were throughout the seventeenth and eighteenth centuries. The population explosion which the Maltese islands witnessed throughout the two hundred years or so of the Order's rule must have been, to some extent, ascribable to the effects of fortress-building activity.

Within the military and technical sphere, the building of fortifications throughout the period under review was characterized by an effort aimed at establishing an all-encompassing defensive strategy designed to cover the whole of the island (including Gozo). This, in turn, dictated an ever-broadening span of projects and a parallel increase in organizational and logistical commitments. The whole process reached its climax by the middle of the eighteenth century with the erection of works such as Fort Manoel, Fort Chambrai and the coastal defences of St Julians, Birzebbuga and Armier. The effort becomes all the more impressive when one realizes that it was accompanied by a similarly huge investment designed to bring to completion many of the monumental, yet largely unfinished, seventeenth-century Baroque schemes around the harbour area – the enceintes of Floriana, Firenzuola and Cottonera.

In terms of military architecture, however, the eighteenth century cannot be viewed in isolation from the previous epochs, particularly the 1600s, when the basic fundamental strategy and many of the processes that were to condition the final configuration of the fortifications were laid down by the Order. Indeed, a considerable part of the building effort invested during the 1700s was intended to bring to completion and rationalize the seventeenth century monumental schemes. This was no mean task in itself especially since most of these vast enceintes had still to be fitted with outerworks and many of the other necessary elements of defence such as retrenchments, magazines, and barracks.

If one can identify any characteristic difference between seventeenth and eighteenth century defensive works, this must surely be the fact that the monumental Baroque schemes of vast and continuous bastioned enceintes projected during the 1600s, such as the Floriana, Sta Margherita and Cottonera lines, had begun to give way to a preference for a system of smaller detached works as the eighteenth century wore on. With the exception of the overtly ambitious schemes of the coastal lines of entrenchments, which were designed to envelope the shores within miles-long stretches of ramparts, a scheme which, however, was quickly abandoned, the defences erected during the 1700s comprised



mainly small batteries, redoubts, and detached forts. Although it can be argued that this development was somewhat dictated by the state of the Order's dwindling financial resources, it also reflects the increasing trend in military circles towards a new style of military architecture – a shift from the traditional bastioned enceintes to the new polygonal systems that was to become the fashion throughout later centuries. This evolution is best illustrated at Fort Tigné, the last significant work of fortification erected by the Knights and one which was influenced by the writings of Marc Rene, Marquis de Montalembert. Ironically, Montalembert's pioneering ideas found little favour in France since most French engineers clung to the traditional concepts established by Vauban.

And it is largely to Vauban's influence that the Order's defensive works in the Maltese islands during the eighteenth century owe much of their shape and appearance. Indeed, the second important characteristic feature of the Order's eighteenth century fortifications is that they are all a product of French military architecture, as opposed to the previous two centuries where the fortifications were invariably of Italian design. This was no coincidence, for by the late 1600s the Order found itself shifting from the imperial into the French sphere of influence, lured by France's growing military might and prestige in the world. And in military architecture, France was then undisputedly the leading exponent.

The real connection began with Grand Master Perellos' request to King Louis XIV for military assistance following the emergency of 1714, when Malta was once again threatened with attack by the Turks. The generous French response was as much a case of political alliance as it was a calculated act of propaganda. For along with French guns, cannon, and munitions came also a corps of French military advisors. Brigadier René Jacques de Tigné, who headed the mission, was then one of the most experienced engineers in France with 26 years of service. Assisting him was Charles Francois de Mondion, and a troop of lesser engineers. Between them, these two military experts would effectively reshape the Order's military establishment, dictating the course of the development and design of military architecture in the Maltese islands throughout the rest of the century. Mondion would eventually go on to serve the Order as resident engineer until his death in December 1733. His eighteen years of service represent the most intense period of fortress-building activity in the Island's history wherein some of the best and most beautiful examples of forts and fortifications were erected and where most of the existing fortifications were either remodelled or finished with all the modern adjuncts of defence that eighteenth century French military architecture could offer.

During this seminal period, the ensuing imprint of French ideas extended to cover all aspects of military architecture, from the planimetric design of a fort down to the decorative elements of Baroque gateways. Not surprisingly, many of these new elements, such as the purposely-built pulveriste and drawbridge mechanisms introduced by Mondion were described in the Order's documents as being à la Vauban.

It was not simply new devices, however, that the French military engineers brought over with them to the Malta. They also helped usher in a new sense of professionalism in the field of military architecture. The prima donna attitude of many earlier haughty Italian military engineers, such as Floriani and Laparelli, was replaced by disciplined men who were the product of a controlled system and a formalized school of engineering¹. The systematical and methodical approach of the French military mind is perhaps best reflected in the many well-prepared and beautifully executed plans of the fortifications projects still to be found preserved in the National Library in Valletta together with their accompanying analytical reports. These scaled, meticulously detailed

technical drawings and sectional elevations, drawn to an established convention, contrast markedly with the relatively crudely-executed designs of the earlier Italian engineers.

The Order's documents also reveal a fortress-building activity that followed very closely the contemporary technical practices, consonant with the conventions of the profession at the time – from the techniques of surveying to the geometric configuration of plans; from the design of countermine tunnels and gunpowder magazines to the working mechanisms of drawbridges; from the gradient of ramparts walls to the ornamentation of Baroque gateways. Indeed, the close resemblance of some of the adopted solutions to designs featured in various illustrated treatises of the period, such as those of Bernard Forrest de Belidor's treatise *La Science des Ingénieurs dans la conduite des travaux de fortification et d'architecture civile*, stand witness to how instrumental printed material had become in exporting ideas and standardizing patterns. The attempts to introduce the Gribevaux carriage in the late 1780s, for example, also stands witness to the desire to remain in line with all the latest technological developments.

The Knights and their military engineers, however, did not simply keep abreast of developments but were at times even able to lead the field. The development of the fougasse-pierrier, the bonded-merlon reinforced against displacement (at Fort Chambrai), and most importantly, the construction of Fort Tigné, one of the first truly polygonal forts, were important contributions to the art of fortification – they were to exert a profound influence on the British military throughout the course of the nineteenth century.

The stimulus of foreign ideas was balanced by the local building practices, dependent as these were on the nature of building materials and long-established traditions, and by the idiosyncrasies of native expertise. Above all, the Order's builders were constrained to operate within a long-established administrative and organizational framework that had changed little from the time of the Order's early years in Rhodes. This structure was primarily designed to retain direct control over the whole process securely in the hands of the Knights – from the selection of the engineer down to the distribution of materials and supplies, at all levels of the building process. The only notable development throughout the 1700s was that the whole apparatus became somewhat larger and more bureaucratized, a trend common to most of the other institutions of the Order throughout this period.

The official to emerge most in charge of the fortification building process during the eighteenth century was the resident engineer. Mondion, Marandon, the Bali de Tigné and Tousard acquired a freedom of operation, particularly in designing and conceiving new projects, that would have been the envy of their seventeenth-century counterparts. Hitherto, such a privilege had generally rested solely with the visiting experts invited over to advise on specific projects. Reliance on direct foreign expertise in the earlier Hospitaller tradition is largely conspicuous for its absence throughout the 1700s. To a large degree this is explained by the fact that Tigné's scheme was adopted by the Order as the definitive master plan for the defence of the fortifications in 1715 in an attempt to prevent a recurrence of the needless expenditure and changes of plan that had resulted from an over-abundance of conflicting advice from numerous foreign experts during the late 1600s². Although, in reality, Mondion, Marandon, and the Bali de Tigné were simply working within the plan originated and masterminded by Tigné, they were still able to achieve more than just the supervision of the day-to-day



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works. Marandon, for example, invented and introduced the fougasse³, and Mondion redesigned Fort Manoel and built various gateways among other projects. The sole exception to this pattern was the visit of the French military mission, headed by Bourslemagne, which was called in during the emergency of 1761. Even so, this brief interlude did not lead to the implementation of any substantial new works.

The eighteenth-century building effort was driven by a locally raised workforce. The labour shortages of the sixteenth and early seventeenth centuries had given way to a surplus of manpower by the 1700s and at least one documented instance has been encountered where fortification schemes were purposely used as an opportunity to provide work for hard pressed inhabitants. The smaller scale of the eighteenth-century building projects, when compared to the massive seventeenth-century schemes meant that although the actual size of a work force at any one site was considerably much smaller, there were usually many more building projects going on at the same time. In one of his reports, for example, Tigné records that during the final phases of the works on the Floriana lines there were only two masons working on the left branch of the hornwork and on the construction of some traverses in the ditch⁴. Again, the building of Fort Chambrai in the 1750s never saw more than 200 persons labouring on site. This contrasts sharply with the 4,000 or so men toiling on mount Sciberras in 1566. Yet in the years 1715-1720 there were over fifty separate building projects materializing all across the archipelago. There is then the fact that there was never the same sense of urgency during the 1700s as there had been during the construction of Valletta. Fortifications built in times of peace progressed much more slowly than those put up in times of war.

The late eighteenth century also saw the Order attempt to introduce and maintain squadrons of sappers for use in times of siege, in imitation of the practice which was being introduced in most European armies of the time. These were generally based on a system of volunteers, recruited from the various guilds and comprised a company 200-strong by the time of the French invasion in 1798⁵.

In terms of building methods and materials, the eighteenth century saw little divergence from earlier practices. The fortress-building activity remained a predominantly labour-intensive one where tools and equipment employed had not changed much from earlier medieval and Roman times. No complex mechanical devices seem to have ever been employed for shifting large volumes of earth or lifting of huge weights. The one notable introduction was the use of explosives (*fomelli*) to facilitate the quarrying and clearing of rocky sites, a practice which was used extensively during the construction of the coastal entrenchments in the second half of the eighteenth century⁶.

Stone was the basic building block of fortress construction, its quarrying, transportation, and dressing similarly unchanged from earlier

epochs. The size of the stone blocks was still that which was introduced in the earlier days of Hospitaller rule (course height of 41cms). The only development was the application of rustication, but this was largely limited to the smaller coastal works and was added mainly for aesthetic rather than military purposes. The sandwiched form of rampart construction, with earth filling, remained the standard form of wall building, though outer face walls were given a steeper gradient in line with the formula established by Vauban and later engineers. Earth retained its importance as the best effective shock absorber in the formation of ramparts and continued to form the body of terrepleins and glacis, though the scarcity of soil in the Maltese islands usually meant that the terreplein had largely to be composed of the rock and stone chippings generated during the quarrying of the ditch. The splintering qualities of this type of debris made its use in parapets and other breastworks quite dangerous to the guncrews and defending troops sheltering behind parapets. As a result, local parapets continued to be revetted with dressed stone and designed to resist displacement rather than absorb the momentum of incoming shot. Although the French engineers found little merit in such a manner of construction they tended to recommend the strengthening of the existing breastworks (by raising their height) rather than their substitution for earthen ones, given the magnitude of such a task.

The scarcity of earth also meant that even the usually more ephemeral field defences, as introduced in the shape of coastal and inland entrenchments during the course of the eighteenth century, had to be built of stone in the manner of permanent fortifications rather than in earth. In such cases, however, a dry-stone walling technique, known as '*à pietra à secco*', was employed without the use of mortar although at times wet soil was used to provide a degree of binding strength to such works. The use of earth as a binding mortar, even in normal ramparts, was a practice which remained in widespread use throughout the 1700s. Many engineers decried this habit as earth did not produce very strongly bonded walls, especially in repair works. Others believed it was a good cost-effective substitute that could be resorted to in order to cut down on expenses, for the production of lime consumed vast amounts of wood fuel. Although wherever possible dry brushwood collected from around the countryside was used to fire the kilns, the pressure of ongoing works meant that there was also a heavy reliance on imported timber⁶, inevitably raising the cost of production of this important material and at times causing difficulties in meeting the required production quotas⁹.

The scarcity of timber can also be gauged from the fact that even as late as 1782 many fortress gateways were still lacking their wooden doors and drawbridges, some which had to be walled up¹⁰. The list of building materials present on site during the building of Fort Chambray, for example, shows how every single piece of timber was inventoried and accounted for. Col. Morshead, Commanding RE in Malta in 1832, records how the woodwork of most coastal towers and redoubts around the island had been 'stolen and carried' away by the public¹¹.

The eighteenth century also witnessed the need for greater control over all building materials and supplies. New, and firmer, regulations were laid down by the Chapter General of 1776 in order to ensure greater accountability over the resources, particularly the supplies of wood, metal, lime and *pozzolana* held in various magazines, with consignments of new stocks having to take place in the presence of auditors and detailed records kept of all provisions¹².

The eighteenth century saw ever-increasing burdens imposed by an ever-growing system of fortifications. By the latter half of the 1700s, it was no longer possible to give attention to all the elements in the defences and inevitably some areas went neglected for many a decade. Even so, the Order exerted great effort to maintain the fortifications

in a reasonable state of repair and even when impoverished by the confiscation of its European revenues towards the end of the 1700s, it always sought to allocate some funds towards the upkeep of the fortifications. By 1795, however, many repair works had to be suspended and subsequently abandoned for a lack of funds.¹³

Like today, most of the causes of decay resulted from erosion, torrential rains and vegetation, and even the inhabitants were not lacking in contributing to the spoliation of parapets and walkways. The Knights were also not impartial to allowing considerable sections of the fortifications to serve as private orchards and gardens, and even as a form of social housing for the poorer sections of the Maltese society – an unmilitary practice that did little to contribute towards the overall upkeep and good state of repair.

The picture that emerges of the fortifications during the eighteenth century is that of a complex network of defences where nearly all of the defensive components had been laid out according to the defensive master plan established earlier at the beginning of the century by Tigné. Some areas such as the Corradino heights and Ta'Xbiex, however, still lacked any fortifications and even Dragut Point had only just been fortified with a small new work that was completed in 1795. Many, though not all, of the forts and fortresses had been fitted with all basic adjuncts of defence – outerworks and countermines, glacis, powder magazines, drawbridges, sally-ports etc. Yet the whole system, although generally depicted quite neatly on contemporary maps and plans of the harbour was still not quite so complete in all its details. Bourlamaque's remark, in 1761, that Fort Manoel was a 'model of fortification' could not be said of all the other fortifications, including those on the nearby island of Gozo, and of the system of coastal defences.

This state of affairs emerges very clearly from the early reports of the British military in the nineteenth century. The British documents show that even though the fortifications were hardly tested in action during the French blockade and were, therefore, inherited in a relatively undamaged state, they appear in a prevailing state of unreadiness, and sometimes disrepair¹⁴. Notably lacking were infantry banquettes and firing platforms while many ditches, scarps, countermines, and glacis were on the whole uncompleted. Indeed, they echo in a way many earlier reports prepared by the Order's engineers and help bear out the fact that the Knights lacked the resources during their last years on the Island to enable them to maintain and finish all the defensive works.

Yet this was not the reason why the whole network of defence works succumbed to Napoleon's troops when finally put to the test in 1798. Ironically, neither the well-thought out and engineered design solutions adopted by the Order's engineers nor the carefully chosen building materials and time-proven methods employed by the local builders played any part at all in the drama of the Order's capitulation. It was the Order of St John itself, and not the walls with which it had sought for centuries to surround itself, that had collapsed.

- 1 D. de Lucca, Mondion, The achievement of a French military engineer working in Malta in the early eighteenth century (Malta, 2003), 1.
- 2 Alison Hoppen, 'The Fortification of Malta by the Order of St John (2nd edn. Malta 1999), 107.
- 3 S. Spiteri, The Fougasse – The Stone Mortar of Malta (Malta, 1999), *passim*.
- 4 NLM, Lib Ms 1301, 153; Hoppen (1999), 108.
- 5 C. Testa, The French in Malta, 29, cited from C. de La Jounquiere, L'Expedition d' Egypte, i (Paris, 1899), 591, n.1.
- 6 AOM 6546, *passim*.
- 7 NLM Lib. Ms 590, no pagination.
- 8 AOM 646, f.134 (1687).
- 9 AOM 648, f.300v-307.
- 10 AOM 1015, f.276 1781.
- 11 Public Records Office, Kew, WO 95/910.
- 12 AOM 309, f.92.
- 13 AOM 1015, f.437 (1795).
- 14 S. Spiteri, British Military Architecture in Malta (Malta, 1996), 23; Public Records Office, Kew, MR 529/0; Royal Engineers Museum RE 4501-133/1.