

# Scale models and the coastal fortifications of Malta

By Stephen C. Spiteri

Building fortifications and preparing for war has always demanded a good deal of planning. From around the sixteenth century onwards, a large part of the military engineers' planning efforts came to be increasingly invested in acquiring an understanding of the landscape in order to ensure the most efficient exploitation of its features. To this end, meticulous scientific surveying and the creation of detailed maps and plans became a *sine qua non* of all military endeavours, critical in both in the implementation of defensive schemes as well as in the preparation of offensive campaigns.

A very important tool employed to this end was the humble scale model, the *modello*, or *plan relief*, constructed of wood, wax or stone. Indeed, even today, scale models are still regarded as the most practical and effective means of conveying, to both planners and laymen alike, the three-dimensional qualities of both terrain features and the complexity of architectural projects alike. Given the limitations of early map-making and architectural designs, few people could successfully visualize the three-dimensional implications of two-dimensional drawings. Scale models, on the other hand, served to bridge the gap between ideas and concepts, and the real world. Their physicality also provided a simplified and comprehensible overview, 'in the round', so to speak, of the various components of a scheme and their placement within it.

This relationship between scale models and military architecture and fortification-planning is also to be found in the history of the Hospitaller knights. Although the use of such scale models is only modestly documented, it is enough to show that the knights, too, made good use of such visual aids. Indeed, one of the earliest mentions of a scale model made for military purposes was actually a wax model of the Hospitaller fortress of Rhodes, prepared by

Maestro Zuenio and commissioned by Grand Master L'Isle Adam to be sent to the Pope in Rome so as to keep him updated on the latest additions to the city's bastioned enceinte, made by Basilio della Scuola, the Order's engineer commissioned to upgrade the defences in 1519.

The records of the Order of St John also provide various other references to the use of scale models in the planning of new works of fortification in the Maltese islands. Amongst these, one of the earliest mentions is that of a *modello*, accompanied by a drawing, of a coastal tower for the defence of St Paul Bay which was presented to the Order's council by Grand Master Alof Wignacourt on the 7 November 1609:

*'Monsign. Illmo Gran Maestro fatto vedere alli Vend. Signori del Consiglio il disegno, et modello di una Torre, che per molti buoni effetti converebbe, che si fabricasse alla Cala di San Paolo specialmente per guardare il porto della Mistra cossi da inimici, como per sicurezza delle Galere, et altri vascelli amici quando gli convenesse per nottare in detta Cala, e porto: Fu di unanimo, e concordo voto, e parere di tutti li signori de Comsiglio laudato et approvato il bon pensiero, e disegno di fabricare la detta Torre, et cosi hanno ordinate, che si debba fabricare: il che udito da sua Sig. Ill.ma spontaneamente si offrese di farla fabricare, a spese sue proprie, e non del comun Tesoro, del che fu molto laudato, e ringratiato da tutti li su[detti] signori di esso Ve. Consiglio'.<sup>1</sup>*

Similar models appear to have been built for the other towers erected by Wignacourt and some thirty years later Capitano Antonio Garsin, a French military engineer from Marseilles living in Valletta, is also documented as having received the sum of 110 *scudi* for drawing up two plans and for constructing three models of a tower



in Mellieħa, as well as actually supervising its construction over a two year period lasting from December 1647 to around April 1649.<sup>2</sup>

On a more ambitious scale were the *modelli* sent by Giovanni de Medici, the Marquis of St Angelo, in 1640, showing his proposals for the erection of four new counterguards to be added to Francesco Laparelli's land front of Valletta.

Some decades later, in 1681, Dal Pozzo records that the Flemish military engineer Don Carlos de Grunenberg prepared scale models to explain his proposed projects for the new works at Floriana, and elsewhere around the Grand harbour, to the Order's council. Three of these finely executed models, carved in *tal-franka* stone, showing the Carafa Bastions, Fort St Angelo, and a section of the Floriana enceinte near the Bastion of Provence, have fortunately survived. Apparently, these stone models were also used to instruct the young novices of the Order during the course of the eighteenth century, for they are recorded as having been kept in the library of the '*casa della cammarata*'.<sup>3</sup>

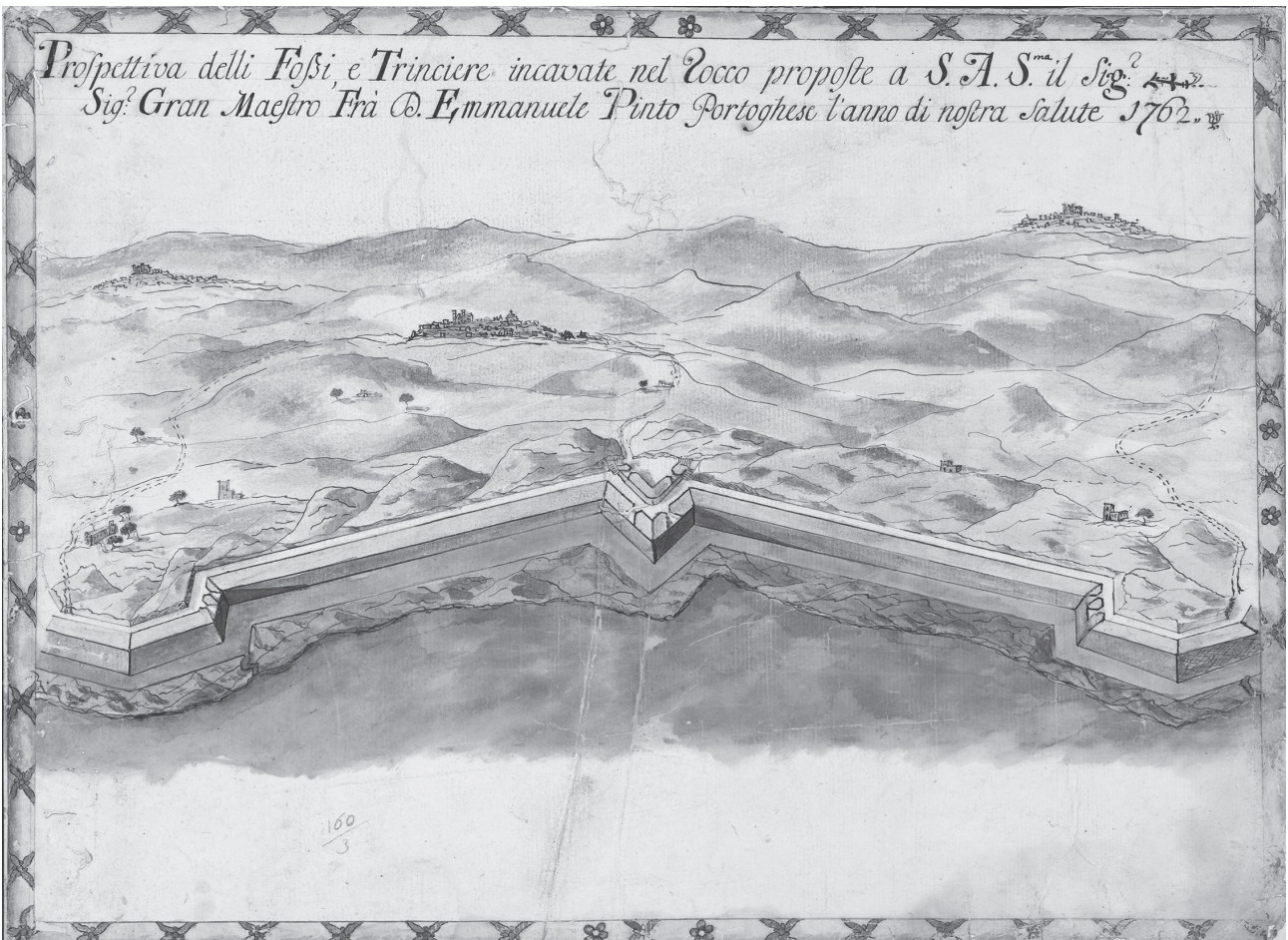
The Palace Armoury in Valletta contains another stone model from this period - this depicts a section of a bastioned front in the Dutch

*Above: Scale models were a practical means of explaining projects to both lay persons and military men alike. The Order's historian, Dal Pozzo, records that in 1681 the Flemish military engineer Don Carlos de Grunenberg prepared scale models in stone showing his proposed projects for new works at Floriana, Fort St Angelo and around Fort St Elmo (above). All were finely executed models carved out in Globigerina Limestone. These are recorded as having been kept in the library of the 'casa della cammarata' (the training college where novice knights received their education) throughout most of the eighteenth century.*

style (*all'Olandese*) but it does not represent any of the Hospitaller fortifications erected in the Maltese islands. This, too, may have been used a teaching aid in the study of military architecture, a subject which was taught to the young novice knights together with mathematics and geometry.

The use, or proposed use, of scale models of the Maltese terrain itself is much less commonly encountered. But at least two instances have been encountered by the author. The first, dating to 1609, refers to a scale model of St Paul's Bay which was put together to assist with the siting of the new coastal tower mentioned earlier. This terrain model was constructed





Above, Aerial drawing showing Bali Fra Domenico Antonio Chyurlia, showing his proposed system of coastal entrenchments as presented to Grand Master Pinto in 1762. (Image source: Courtesy of the National Library of Malta).

*detta Torre la potranno molto bene guardare, come anco le due acque che surgano alle marine di d[ett]a Cala; affermando che sopra detta Punta stara' tanto meglio posta la d[ett]a Torre, quanto che l'e' la piu vicina alla strada Maestra, et al Casal Nassaro'.<sup>4</sup>*

following a detailed and measured survey of the whole bay and its various inlets, an exercise which was undertaken by a team of military experts and engineers. This was no mean task by any standards, especially with the limited instruments available at the time, for the anchorage at St Paul's Bay extends over many miles:

*'Percio visto e' riconosciuto il tutto particolarmente ci parse che la Punta vicina alla Chiesa di S. Paulo fusse la piu' alta, e proportionate per fabricarvi d[ett]a Torre, onde si levo' la pianta con tutte le distanze, e misure di tutta la d[ett]a gran Cala facendone il disegno, sopra il quale se nefatto il modello, sic he per la veduta e frontier che ha la d[ett]a a Punta con il Porto, o' sia Cala detta la Mistra [Mistra] che e dentro detta gran Cala di San Paulo che non vi e' dal una all'altro piu' distanza; che di circa 250 canne; e i pezzi di pezzi d'Artiglieria che si metteranno sopra*

This model has not survived, unfortunately, but this information reveals the importance that an understanding of the terrain and its topographical features was given by the knights in planning the defence of their tiny realm. This same concern with the layout of the landscape can be found in the military plans prepared by Brig. François Charles, Comte de Bourslamaque and his second in command, the French military engineer Nicholas de Pontleroy in 1761 showing the coastal areas and shores of Malta and Gozo. Their plans, drawn in large scale, were made to facilitate the planning of positioning of the batteries, redoubts and entrenchments that were thought necessary as a front line of defence against any naval invasion. The strategy of constructing this system of coastal defences, conceived as physical barriers to an invading force, was first established in 1714-16. Bourslamaque's concern was to ensure that the remaining lacunae along the long shoreline



were adequately fortified and the gaps sealed shut. In practice, this meant the constructions of many miles of coastal entrenchments, designed to transform the whole island, literally, into one large fortress. The entire success of this coastal defensive strategy hinged around the construction of an unbroken line of *trincieri* or *trinceramenti*, a type of bastioned seawall fitted with its own rock-hewn ditch and designed to present a physical barrier to invasion.

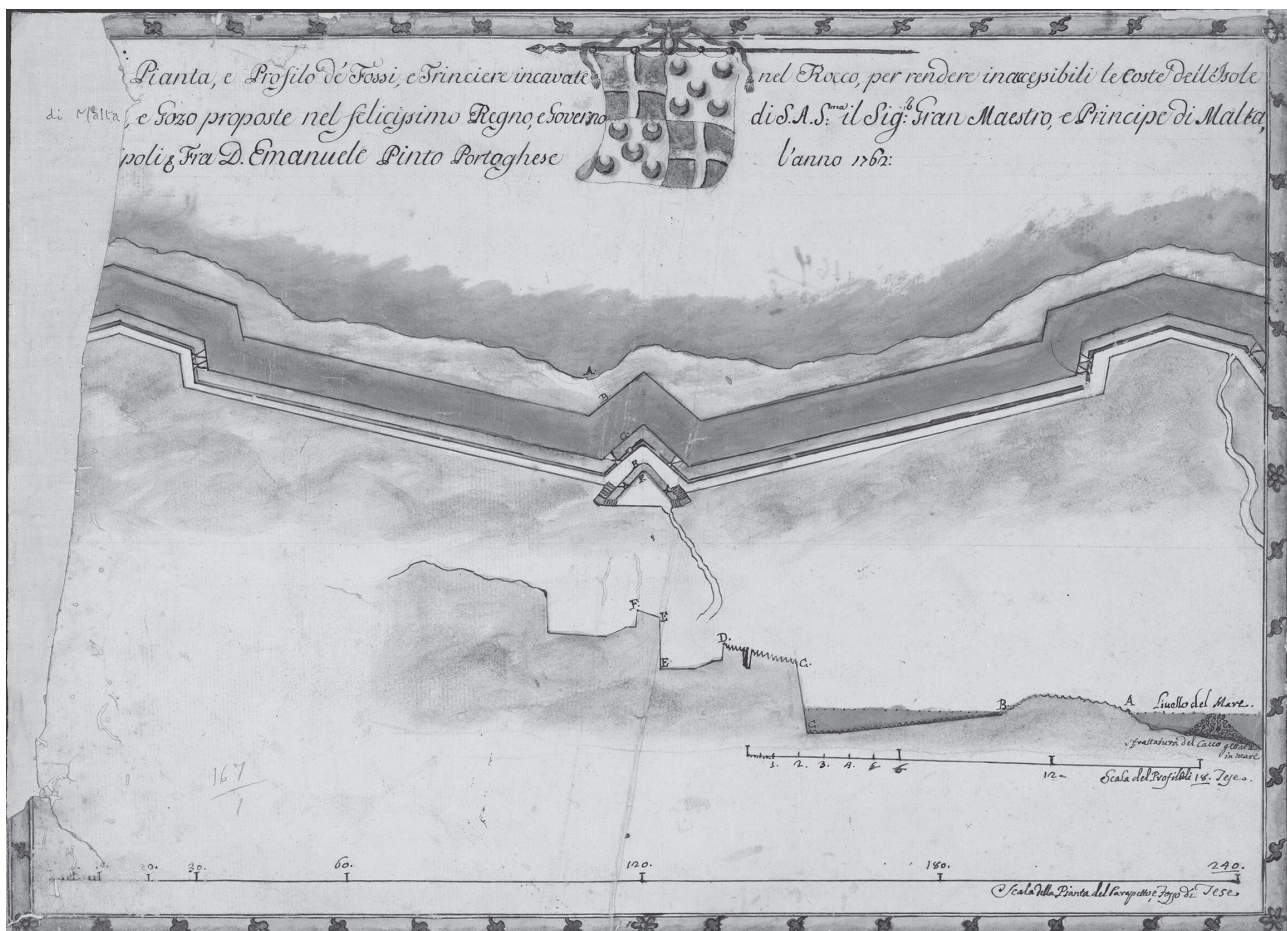
Not surprisingly, however, this ambitious scheme soon ran into serious difficulties and, in reality, only a very small portion of the coastline was fitted out in the envisaged manner. Understanding which parts of the shoreline required additional ramparts, and which parts did not, or could be easily exploited and transformed with a simple intervention such as the scarping of the rock-face, was therefore of vital importance. Many of these seawalls were built to the formal conventions of the bastioned trace, while others were constructed in a much cheaper and ephemeral manner as rubble walls, in the *pietra à secco* style, as this was then called. The 1761 emergency, in particular, triggered off by the episode of the *Corona Ottomana*, saw the commencement of the most

serious effort, albeit the last, in the construction of coastal entrenchments, strongly advocated by Bourtoulamaque and his French team.

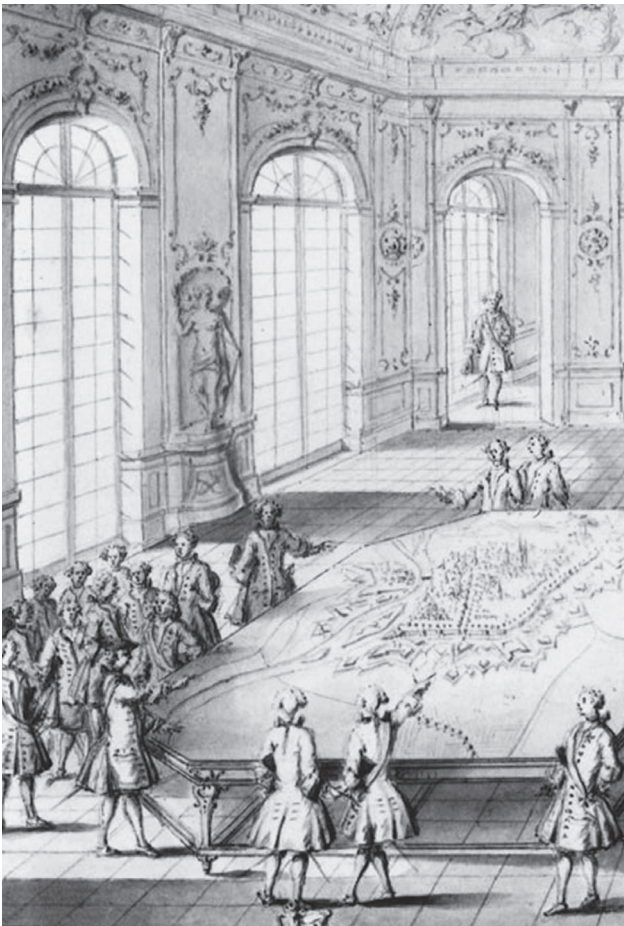
Even so, many of these coastal works were abandoned half way through after nearly a decade of construction, largely for the want of money but also because of a growing realization that the whole notion of an island-wide defensive scheme, involving endless miles of bastioned ramparts, was then far beyond the Order's ability to defend, both logistically and in terms of the limitations of its manpower resources.

Despite these critical limitations, there does not seem to have been any real criticism of the scheme. What doubts the knights did have, and expressed, about the validity and usefulness of the project, they did not question the concept itself, but rather the minutiae of the shape and form that the defences were to take to fulfil this role in the most efficient and effective way possible. This comes out very clearly in the debate between Bali Fra Domenico Antonio

Below, Plan showing Bali Chyurlia's proposed system, dated 1762. (Courtesy of the National Library of Malta.)







Left, A print of 1753 showing the French king and his advisors consult the model of Maastricht in the Grande Galerie of the Louvre (Image Source: Courtesy of the Bibliothèque de l'Arsenal, Paris). Above, one of the many plan reliefs from Louis XIV's reign, now on display at Les Invalides, Paris.

Chyurlia and the knight Francois Renè Jacob de Tigné, then the Order's newly-appointed commissioner of fortifications. The argument developed over whether coastal entrenchments were best configured to the redan rather than the bastioned trace. The knight Chyurlia argued that the rules employed in the design of major bastioned fortresses did not hold for coastal rock-hewn entrenchments where large bastions, designed to hold sizeable detachments of men, were useless. Field entrenchments were considered to be more effective if built to a redan, or sometimes tenaille, trace for these allowed better enfilading musketry fire along long stretches of coastline. Consequently Chyurlia also favoured longer curtain walls than those designed by de Tigné, in order to reduce the number of bastions, and also introduced small redans with internal ravelins half way along the curtains. Balì de Tigné, on his part, held differing views as to what constituted the best design for coastal defences; where Chyurlia considered an island-wide system with just 50 bastions to be adequate, de Tigné called for 200 bastions connected by very short curtain walls and armed with heavy guns of at least 24-pdr calibre.

In end, however, this argument proved to be little more than a hotly debated academic exercise for the Order had no resources equal to the task, either way. It is one of the oddities of late eighteenth-century Malta that the knights seriously envisaged encircling the whole island with a solid ring of ramparts when they had neither the men nor the money to implement such a massive project. Even more baffling is how otherwise level-headed and practical engineers like Balì de Tigné were caught up in such impracticable schemes.

What is relevant here in all this, however, are the written suggestions regarding this debate which Chyurlia sent to Grand Master Pinto outlining his views on the subject. In his memorandum to the Grand Master, dated 25 April 1763, Chyurlia proposed that a detailed and accurate large scale map of the coastal areas of Malta, spanning from Marsaxlokk all the way to the shore facing the Gozo channel was to be drawn up and placed at the palace. Featured on this map were to be indicated the plans of the proposed entrenchments. This plan was to be significantly large, spanning the whole length of the *Gran Sala del Appartamento* of the Grand Master. The Grand Master's palace, in

Valletta, one must recall, was the political and military headquarters of the Order in Malta, the main general headquarters so to speak of the Hospitaller knights. Equipping it with a large scale plan of the Maltese shore line, therefore, would have given the military commanders an important planning tool:

*'Per vedere in convent quello che si e' ragionato in astratto, buona cosa sarebbe che V.A. E ordinasse che si prendesse una pianta esatta della Costa da marsasirocco fin alli Frei, che detta pianta si trasportasse [ ? ] in terra della lunghezza della gran Sala del Appartamento di VAE e sopra di quella formare li due piani delle Trincere secondo il sistema ....'*

Better still, Chyurlia suggested that the plan was to be reproduced in the form of a scale model built in wood, divided into twenty or more equal panels, which were to be kept around the *loggia* (the arched gallery corridor) of the Grand Master's palace, protected under canvas. The models were to show all the hills and topographical features, built to scale and painted realistically as possible.

*'Più conveniente migliore sarebbe poi fare detta piadta grande in modello di legno per vedere tutti i siti, e colline contigue poste in proporzione e colorate al natural, e dividerla in 20 o più parte da situarsi intorno alle loggie del palazzo per conservarle coperte di tela...'*

Such models, Chyurlia goes on to state, would allow the Grand Master to have a collection similar in purpose to those which both the kings of France and Naples had at their disposal, '*... come tiene il Re di Francia nella sua Galleria tutte le Piazze Forti del Suo Regno, e come sia fatto fare di quelli del Su oil Re di Napoli.*'

The French King's collection of relief maps, perhaps the most famous of all such collections, went back to the mid-seventeenth century, when it was inaugurated by François Michel Le Tellier, Marquis de Louvois, French Secretary of State for War during the reign of King Louis XIV.<sup>5</sup> The collection, originally kept in the ground floor apartments of the *Palais des Thuilleries* (Tuileries) (a royal palace which situated on which stood on the right bank of the River Seine until it was burned down by the Paris Commune in 1871, grew with Louis XIV's military conquests and by 1697, according to an inventory drawn up by Vauban, contained

144 models. By 1763, however, at the time of Chyurlia's writing, the collection had been moved to the *Galerie du Bord-de-l'Eau* (now the *Grand Galerie*) of the Louvre, where it could be viewed, with royal permission, by visiting dignitaries, diplomats and foreign military men. Chyurlia's knowledge of its existence may have resulted from such direct firsthand experience. The thirty or so remaining models executed in Louis XIV's reign can nowadays be seen in the *Musée des Plans-relief*, at the *Invalides* in Paris.

The collection of similar plans-reliefs belonging to the king of Naples, as mentioned by Chyurlia is less well known. The Venetians too, at the turn of the seventeenth century kept scale models of its fortresses and outposts in the Aegean and the Adriatic.

To build the proposed model, Chyurlia suggested that the Order bring over an able model builder from Naples, and believed that, together with the assistance of local craftsman, the project would be completed within a year's time: '*... E percio basterebbe far venire da Napoli o d'altrove una o due persone abili a questo, mentre per la esecuzione sarebbero abilissimi gli scrittoriari (/) di Malta, e questo Modello potrebbe compirsi nello spazio di inca. un anno.*'

It is not known whether or not Chyurlia's idea was ever taken on board by the Grand Master or if his proposed model was ever built or not. The records are silent on the matter and no reference to the existence of any such large *plan-relief* have turned up in any description, or inventory, of the Grand Master's palace. Given the size of the proposed model, it would hardly have gone unnoticed. Perhaps, had the Order heeded Chyurlia's advice, then maybe Grand Master Hompesch and his military commanders would have found a good tool to help them plan a more credible defence against Napoleon's invasion in 1798.

## Sources

1. National Library of Malta, Archives of the Order in Malta (AOM) Vol. 103, f.104.
2. S. C. Spiteri, *In Defence of the Coast: The Bastioned Towers*, Arx Occasional Papers, 2014, 84.
3. S.C. Spiteri, *The Art of Fortress Building in Hospitaller Malta* (Malta, 2008).
4. S.C. Spiteri, *In defence of the Coast*, *op.cit.*
5. Isabelle Warmoes, *Musée des Plans-Reliefs. Historic Models of Fortified Towns* (Paris, 1999).