

SPANISH FORTIFICATIONS FOR THE DEFENSE OF THE WESTERN MEDITERRANEAN

(FORTIFICACIONES ESPAÑOLAS PARA LA DEFENSA DEL MEDITERRANEO OCCIDENTAL)

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ABSTRACT .- The Reconquista being finished, the defense and control of the Spanish and Italian coasts forced the Spanish crown to fortify the new systems of bastions of the Western Mediterranean maritime cities. As the largest fortifying company of its time it raised castles, forts and walling with modern systems of military engineering, not only on the Spanish coast but also in the city of Naples, Sicily, the island of Malta and the African port of Oran, Algiers and Tunis.

Keywords: Modern fortification. Spanish military architecture. Fortification of North Africa.

RESUMEN.- Acabada la Reconquista, el control y la defensa de las costas españolas e italianas obligó a la Corona Española a fortificar con los nuevos sistemas de baluartes numerosas ciudades marítimas del Mediterráneo Occidental, la mayor empresa fortificadora de su tiempo, levantando castillos, fuertes y amurallando con los modernos sistemas de la ingeniería militar, además de la costa española, la ciudad de Nápoles, la isla de Sicilia, la isla de Malta y los puertos africanos de Orán, Argel y Túnez.

Palabras clave: Fortificación moderna. Arquitectura militar española. Fortificación del Norte de Africa.

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1.- THE SPANISH EAST COAST DEFENSES

A huge and very extensive coastline which exposed to view the entire eastern territory of the Iberian peninsula, from the Strait of Gibraltar to the border with

France, the most fertile and conducive to commerce and navigation for centuries, became the most vulnerable war front line throughout history. The ownership of these Hispanic territories, during the Middle Ages, by Muslim kingdoms, from the occupation of the peninsula by the Arab army in 711, forced during the Christian reconquest to have two fronts. The sea as a place of strife and fighting and the territories themselves incorporated into the kingdoms of Castile and Aragon, with the majority of Muslim populations, in permanent contact with the immediate African territories.

The early Christian expansions from Catalonia to the south, and its penetration to the Mediterranean Sea, led them to conquer the Balearic Islands, and the war company acquired the character of a religious crusade. Majorca and its neighboring islands were a continuing threat to the coast of the kingdom of Aragon, until its conquest, although in the field of military architecture, the fortifications of the Christian conquerors were supported by Muslim citadels, like the palaces and other civil buildings. They took advantage of the defensive structures until the arrival of modern bastioned architecture in the 16th century, coinciding with the largest offensive of the Turkish and African squadrons, in successive waves against the Spanish coastal towns, which were completely insecure, distant and unprotected. The incorporation by Castile of the southern Muslim kingdoms must be added to these Levantine coasts. These southern territories were much closer to Algerian and Moroccan lands, in confrontation with one another, with Moorish populations subjected to the Christians on the Spanish coast, and massive cargo of Christians slaves in the cities of North Africa, known as Barbary.

During the 14th and 15th centuries, the Aragonese control over the Muslim population of its kingdom was constant, because the clashes with the African kingdoms or the Andalusian normally represented a general uprising of the submitted Moors, which were banned, for example, of carrying guns. (1) There even existed Christian lands in Levant and Andalusia with large pockets of Muslim population, on which strong pressure was exerted to convert to Christianity, which would lead to a suspicion of the old Christians and converted Moors. An order by the Catholic Monarchs in 1502, forced the Muslims to convert. The consequences of false acceptance of Christian belief ended with the expulsion from Spain of all the descendants of Hispanic Muslims in 1609. The expeditions of expatriated emigrants invaded the coastal cities of Africa, where footprints of Spanish (culture, language, art, etc..) were strengthened, creating in turn a new allied front against Spanish possessions.

The 16th century is the most dramatic period of confrontation between the two cultures in the Spanish Mediterranean coast. During the three periods that correspond to the reign of Ferdinand of Aragon, Charles V and Philip II, they faced Mediterranean defensive problems in diverse and different ways. An aggressive strategy corresponds to the first monarch, consisting of finding the enemy in their own home bases or supply bases, undertaking risky naval expeditions of conquest in Africa. With Charles V, began a reform and the new construction of coastal fortifications in Spain and its possessions in Italy and Barbary, accompanied by large naval expeditions of conquest. Philip II developed a whole in-depth defensive strategy with systems of castles and

coastal towers, which almost surrounded the Spanish and Italian coasts. Considering however, the great final battle between the two empires, the Spanish and the Turkish, in the Greek gulf of Lepanto, that regardless the military success it was not as definitive as expected. (2)

1.1.- MODERN FORTIFICATION OF THE SPANISH MEDITERRANEAN TOWNS.

Between the 12th and 15th century the medieval wall of Barcelona rose, which has left material physical proof in some stretches of its layout, such as Santa Madrona built around 1378. The fence of King James I previously ran today's Rambla, leaving extramural the neighborhood of Raval, which joined the city with an extension of the precinct in 1369, during the reign of Pere III, forming two different separated walled nucleus. In the second half of the 16th century, the medieval walls had more than fifty perimetric cubes and seven gates, in addition to a dividing wall that separated the town into two by the riverbed of la Rambla. The port lacked an adequate defense from the shipyards and the convent of Santa Clara. On this front then rose the first modern bastions of the stronghold.

In some interesting drawings from Wyngaerde in 1563 showing views of the city, a bastion protecting the shipyards can be recognized, another minor one at the convent of San Nicolas, and a third one at the Lonja, and two others in the neighborhood side of the convent of Santa Clara, from the Torre Nueva, an ancient port defense. In the middle of the front there was La Marina Gate, a mannerist monumental gate framed by four atlantes and covered with pediment, reminiscent of the gate Nueva of Palermo. During the 17th century, the medieval walls were reinforced in their fronts to the mainland with 10 new bastions, built on the corner of its layout. But it is the Marquis of Verboon behind Philip V's engineers who transformed this precinct and replaced it with more forceful curtains and bastions, knocking down the medieval fence from 1719 (3).

The first Roman capital of Mediterranean Spain, Tarraco (Tarragona), maintained its original Roman wall during the Middle Ages, not being reinforced in the period reviewed here, due to the limited interest in the city in this period, until the 18th century, during the War of Spanish Succession, where its perimeter defenses were not strengthen with a compound of bastions, some sections of which remain still preserved.

On the coast of Valencia, the impressive Peniscola's stronghold delves into the sea on a completely fortified peninsula. Being a Muslim citadel in the Middle Ages, the Christian city became during the 16th century an inexpugnable watchtower, through the design of Renaissance fortifications by Giovanni Battista Antonelli, a military engineer of Philip II, due to pressure and constant threat of Turkish attacks in the area in 1579. (4) The bastioned land front, built on the fence of the old Muslim city, is attributed to Vespasiano Gonzaga viceroy of Valencia, an expert in fortification, with his project engineer also an Italian. (5) A report in 1581 mentions the presence of

Battista Antonelli as a resident in Peniscola where he conducted these constructions, while his nephew Cristobal Antonelli, also an engineer, worked on the fortifications of Barcelona.

The Balearic Islands were from the 16th century vital enclaves of the Spanish Mediterranean defense. Its position bordering the east coast, transformed the islands of Majorca, Minorca and Ibiza into a permanent naval front to stop expeditions against the Spanish coast. Palma, maintained for centuries its ruinous Muslim citadel after the conquest of the island by King James I of Aragon, his successor raised the gothic castle of Bellver in the 14th century. The attacks of Barbarossa to the islands during the 16th century forced the construction of a bastioned wall for the capital around 1574, attributed to Palearo Fratin an Italian engineer, with a total of 10 bastions in the land front. The defense of Mahon, in Minorca, was resolved with the construction of the Castle of St. Phillip at the entrance of the bay. After the destruction of Mahon by Barbarossa in 1535, King Charles V sent his engineer Juan Bautista Calvi, who raised a fort with four bastions in 1556, whose effectiveness was shown when repelling the attack of another Turkish fleet commanded by Piali in 1558. In the 17th century its defenses were expanded with new ravelins and other complementary forts, San Carlos and Felipet. (6) During the next century it acquired the impressive appearance of a massive star, which multiplied the defensive elements over a wide area, only to be completely destroyed by Charles III later, during the English conquests in 1706 and 1763.

The same engineers that were in Majorca and Minorca were the authors of the project (Juan Bautista Calvi 1554) and execution (Palearo Fratin) of the fortification of the city of Ibiza, known as Real Fuerza, which until the 18th century did not have extensions or significant changes. A report describing these fortifications by the military engineer Bartolomé Reynaud in 1798, already warned of the limitations that these Renaissance defenses had since they were obsolete and scarce: *"This fortification is an irregular shaped area without moat or external works, composed of 7 bastions and 2 side piling of quite solid masonry construction, was established in times of Charles V and because the modern art of fortification was then in its beginning, some flaws can be found. The bastions are very small, and each has two empty strongholds where gorges and embankments lack extension"*(7)

The city of Alicante, like the rest of the Spanish coastal capitals, had a citadel from the Muslim era. After the conquest of the stronghold by the Castilians in 1248 it became Santa Barbara's castle, a defensive coastal attack enclave, being renovated several times until the 16th century, when Philip II approved the projects of Antonelli and Fratin for the modernization of the defense system, which suffered several destructions in the following centuries. (8) The city of Cartagena, a former Carthaginian colony, was also surrounded by bastions, with a deep inlet, but until the 17th century the enclosure of bastions was not completed, expanded and supplemented with various isolated forts in the nearby hills, when in the 18th century it was built in the port the naval Arsenal of Spanish fleet in the Mediterranean.

The same defensive problems were encountered in several Muslim cities of southern Spain, conquered in the later stages of the Christian Reconquest,

where first the medieval fortifications of Almohad origin, in most cases, were used and for later, from the 16th century, supplementing the urban port areas with bastions and curtains. This was the case of Almeria and Malaga, while others had to be fortified, between the 16th and 17th centuries, with more complex systems due to their strategic and isolated location, like Gibraltar, or even in African towns of Spanish sovereignty, such as Ceuta or Melilla, where complete frontal precincts, moats and bastions were developed.

1.2.- THE SYSTEM OF WATCHTOWERS ON THE SPANISH COAST

During the 16th century, the Spanish crown developed a system of general control and warning for coastal areas of their kingdoms, consisting of a network of watchtowers scattered along the littoral and communicated with logistical territorial fortifications such as coastal castles or alcazars of cities with more entity. In every region of Spain or its possessions in Italy, there was the system following previous studies of military engineers by their respective viceroys and governors, or by the local councils themselves, with projects for each tower in which topographical cliff benefits were used, the building materials of the area, and the design more in line with the construction techniques of the time.

Catalonia had a complete system of masonry towers with circular or rectangular floor-plans, of which numerous examples are still preserved. Many are of medieval origin and others were built in the 16th century during the reign of Charles V and Philip II. The former corresponds, for example., to the Torre Vieja of Salou, a masonry turret and stronghold floor-plan, built in 1530. In the strategic mouth of the river Ebro the Alfaques were constructed by the later with projects for the towers and their bastions of Juan Bautista Antonelli and his nephew Christopher Antonelli (9). But the overall proposal for the defense of all the Catalan coast was not made until 1587, by the military engineer Jorge Fratin. It accounted for existing towers and their real value as well as the missing ones that would complete the system (10).

Since the early decades of the 16th century, the problems on the coast of the Valencian region required the construction of watchtowers for surveillance and warning, as they had no defensive capability against pirate attacks, the most necessary of which were commissioned by the Italian engineer Juan Bautista Calvi in 1655. Although a more thorough study on this problem, and a general proposal to cover the entire coast of the kingdom of Valencia is owed to the engineer Juan Bautista Antonelli in 1569, who proposed that some of these fortifications would have operational capacity to deal with landings, as the Penyal d'Ifac. The traditional high cylindrical shape prevented the use of these towers by artillery, so a slow transformation towards lower and wider pockets with a capacity for canyons began, all during the viceroyalty of Vespasiano Gonzaga. (11) The towers are divided in two models, in these reports, only normal or ordinary just for surveillance and warning, and those with artillery to defend fisheries and towns, like the Torre del Rey in Oropesa del Mar endowed with casemates for their artillery pieces and its own cistern.

The coastline of the region of Murcia, was also studied in the defensive aspects by Vespasiano Gonzaga viceroy of Valencia, and the engineer Juan Bautista Antonelli, with solutions for construction tower which would begin to be built in the last quarter of the 17th century, the new ones with traces of Antonelli himself. Finally the Andalusian coast, with similar or worse problems of occasional attacks of piracy and plunder from the African coast, was endowed with towers from the 15th century, with medieval structure, to the 16th and 17th centuries, when the defensive network was expanded especially in the coastal area between Malaga and Gibraltar.

These constructions, which went from being mere watchtowers, for surveillance and warning, to becoming the new projects of the 17th and 18th centuries in small artillery fortifications, replacing traditional materials of masonry with limestone, or rendered brick, with regular ashlar, like the basic military elements in larger fortified systems, dependent on castles with strategic and logistic functions over wide areas.

2.- SPAIN FORTIFIES ITALIAN COASTAL CITIES

One of the most important chapters of the Spanish history of military engineering was developed during the 16th century in southern Italy, when Spain undertook the construction of modern fortifications of the coastal cities of the peninsular Italy and Sicily. This was a costly business directly programmed by our monarchs and their viceroys and governors, through the specialized actuation of the most important Italian and Spanish engineers of the time. The fortification of the Italian coastal cities in the western Mediterranean was a considerable effort and a constant concern for the State during the 16th and 17th centuries, becoming an important experimentation ground for the development of modern techniques of bastions during the Renaissance. (12)

Gonzalo Fernández de Córdoba began the conquest of the kingdom of Naples, relying on fortification works consisting of the upgrading of old medieval structures of urban precincts and castles along the coast. He later proceeded to the construction of new defense systems to protect the innumerable fisheries of Sicily which were always exposed to landings and attacks by Turkish ships or North African populations. The sequence of the whole enterprise begins with the first fortifications of Palermo, Messina and Naples to be followed by a period of evolution and review of those initial systems, raised by the various engineers of the Duke of Terranova, Viceroy of Sicily, from 1571. Juan Antonio Nobile, Giulio Cesare Brancario and Juan Antonio Salomón, guided by the two great masters of Military Engineering in the first part of the reign of Philip II, Jorge Palearo Fratin, Scipio Campi and a young engineer trained in Sicily during those years, Tiburcio Spanochi, who was to become Major Master of Fortifications of Philip II, one of our most important Renaissance military engineers. (13) This way the entire historical period of the 16th century is completed, with three generations of Italian and

Spanish technicians, who developed much of their work, theory and practice in Sicily, Malta and North Africa.

2.1.- SANT'ELMO OF NAPLES THE "MACCHINA BELLICA"

The written work of the Spanish military engineer Pedro Luis Escrivá, entitled "*Apología en escusation y favor de las fábricas que se hacen por designio del Comendador Scribá en el Reyno de Nápoles y principalmente la del Castillo de Sant Telmo, compuesta en diálogo entre el vulgo que la reprueba y el Comendador que la defiende*", written in 1538, predates the better known and appreciated Italian treatises of Modern Military Architecture, among which is found "*Citta inespugnabile*" of Tartaglia published in Venice by Nicolo de Bascarini in 1544 and 1546. Escrivá was regarded in his days as a unique pioneer among writers of the bastioned architecture, his work being cited by several Italian authors (14).

The most interesting military construction by Escrivá is the Sant'Elmo's castle in Naples. In its construction all the theories developed by the architect for many years are reflected, about how a perfect fortification construction should be, ideal in its layout and militarily inexpugnable. Like any, in a way, innovative work, Sant'Elmo became the subject of severe criticism and general misunderstanding. The cited treaty written when Sant'Elmo was already being concluded, shows a fortification theorist being beset by adverse judgments, justifying his geometrical and constructive solutions but, by no means, downcast by the critics. His sole judges shall in all cases be, his own conscience as a man and as a connoisseur of his work, as well as his masters Pedro de Toledo, Marquis of Villafranca and Viceroy of Naples (protector and defender of Escrivá) and Charles V the Holy Roman Emperor.

The events that led the fortification of Naples must be placed in 1528, when the French army under the command of General Lautrec and the Genoese Andrea Doria besieged the city, forcing the Spanish garrison to defend the medieval precinct with only 2,500 men from some old fortifications on the hill of San Martín. The siege had to be lifted in less than five months, with Lautrec dying during the attacks. Escrivá, who was then almost 50 years old, was one of the defenders and when remembering those days, he mentioned the difficulty of controlling the complex system of walls and fortifications, it being much more profitable to be able to count on a single fort, with thick walls and perfectly oriented in its layout, as he did nine years later with Sant'Elmo's castle, when the danger of the Turkish army was permanent.

On the hill above Naples existed medieval fortifications in which Francisco di Giorgio Martini had intervened. He was an eminent treatise writer of his time and the author of two towers around the year 1495. They were not pointed bastions in this case, as in his ideal fortified city, interpreted by Vitruvius, because they should corner the walls with circular turrets. After the mentioned French siege, the Emperor Charles V went to Naples in 1535, returning from the expedition to Tunis. Escrivá remembers when he went up the hill with his officers, discussing the best way to build the bastions. The general opinion of men at arms did not coincide at all with the solution of Escrivá, projected two

years later, on request of the Viceroy, and immediately built (15).

Sant'Elmo's castle was complemented with the fortification of the rest of the hill and the construction of imposing moats. Although in 1587 it was partly destroyed, fifty years later it served as a defensive redoubt against the popular uprising of Masaniello, repeatedly bombarding the city from its privileged position. In the 18th century it suffered two consecutive unsuccessful sieges in 1707 by the Austrians and the Bourbons in 1734. Its gigantic mole, in short, has always been considered in the Italian texts as a true "*macchina bellica*" compared to the fine regular layouts of its time.

The layout of Sant'Elmo responds to topographic reality that makes it difficult to accommodate a regular floor-plan. At first sight the floor-plan seems derived from a regular star of six points. It has four symmetrical fronts in pairs. The narrowest ones are simply sunken curtains in its centre to offer an angled map that without the need for bastions allows it to defend itself. Escrivá chose the pincers over the bastions for the defense of the fronts through crossed embrasures, with galleries of artillery and communicated internally by a complex network of galleries. Sant'Elmo, was, nevertheless, not an isolated and unique example. Its strong appeal, in the same century, led other engineers to continue using the same or similar solution, such as in the Florentine Forte di Belvedere .

In the mid 16th century, during the viceroyalty of D. Pedro de Toledo, the majority of Naples' defenses around the whole eastern coast of southern Italy were also extended, with the construction of over three hundred littoral towers as well as the fortification of coastal cities such as Lecce, Gallipoli and Brindisi. The military engineer in charge of designing a general system of fortification of the maritime territory, against the Turkish attacks and their allies of Barbary, was Giovanni Maria Buzzacarino, who participated in modern fortifications of these towns. The same need to fortify the littoral was felt in the island of Sardinia, where the engineers of Philip II multiplied the coastal towers, with powerful fortifications in Cagliari and Alghero.

2.2.- PALERMO AND MESSINA, CENTRES OF THE CONFLICT

Charles V ordered the Palermo walling with bastions when Fernando was Gonzaga the viceroy of the island. Antonio Ferramolino, the Genoese army Engineer of the admiral Andrea Doria, performed the project in 1533. His initiative was to close the town within a huge rectangle formed by long curtains, bastions and a moat, which coincided with the medieval fence that was demolished. Three major fronts spread on land and another maritime front covered port. The south-facing one consisted of five bastions: Pescara (1569-1575), St. Agatha (1570), San Antonio, Spasino (1537) as well as a bastion of Vega in the western corner of the stronghold and the two gates: the one of St. Agatha and the one of Termini, which pointed the ways towards Messina. The northern front with four bastions: Aragona (1572), Gonzaga (1536), San Giuliano (1536) and San Giorgio, that finished its path in the "*Castello a Mare*" of the port. There, the gates of San Giorgio and Carini were opened. Inland, the western front was formed between the defenses of

Pescara and Aragona, the Royal Palace with its bastion of San Pedro (1550) and the Piperito, the only modern fortifications still standing. In the sea port only two bastions were built in 1550, rising the front of the "*Castello a Mare*" (16).

Ferramolino's successor for these fortifications was the Spanish engineer Pedro Prado, with the foremen Facenti Nicola, Vicencio Lavaca and Francesco Durso. Between 1570 and 1576, during the government of the Duke of Terranova, the work was concluded with the completion of the last bastions and the Porta Nova together with the Palacio Real, a monument to the memory of Charles V which was voluminous Mannerist work. At the end of this period, with the last bastions finished, the first voices were heard disagreeing on the gigantic work. On one side, the critical opinion of the military engineers Scipio Campi and Alejandro Giorgi, in which the project indicated the errors of Ferramolino's work. (17) These were summarized in two aspects, the lack of homogeneity in the size and shape of the bastions that were disproportionate to each other, and the excessive length of the curtains. In the mid 18th century, the bastions and the walls began their gradual demolition being used as new residential buildings and gardens.

In the port of Palermo, from the Middle Ages, the Arab-Norman turret "*maschio*" rose, on which the Aragonese built a turreted gate, in the 15th century. On this fortification known as "*the Rocca Vecchia*" rose the "*Castello a Mare*" for the maritime defense of Palermo between 1553 and 1558, under the vicerojal governments of Fernando Gonzaga and Juan de la Cerda, following Ferramolino's traces (18). One of the first uses of this castle was to host the tribunal of the Inquisition, until there was a disastrous fire at its premises in 1589. The use of it as a prison would not disappear for centuries. Garibaldi's troops attacked "*Castello a Mare*" in 1860, which had become an unpleasant symbol of absolutist oppression being assaulted and demolished by the people. The official decision to demolish the remains of the castle was taken in 1922, although the final destruction came on the 22nd of March 1943, when allied air forces bombed the city during World War II. Currently, slow restorations are seeking to recover some remains of the massacred fortress (19).

As it occurred in Palermo, Messina, Sicily's second city, was a priority in the policy of Spanish fortifications from the moment when the Mediterranean became the theater of confrontation between Spain and the Turkish expeditions. During the reign of Ferdinand V of Aragon, Messina had served as a logistics base for the conquest of the kingdom of Naples, but when Charles V conquered Tunis and returned triumphantly to the island in 1535, he was sentencing the future tranquility of the island, by making it the headquarters of the Staff and the center of naval operations of the Mediterranean. This concern coincides with the viceroyalty of Hugo Pignatelli the Duke of Monteleone, who commissioned to Antonio Ferramolino, the fortification of Messina, and later the rest of the coastal cities (20).

Ferramolino was building the bastions of Palermo when he was sent to fortify the port of Messina, where he designed the bastions of all the retaining wall of the city, as well as the fortification of the high levels of its immediate

environment and also the construction of the castle of el Salvador in the pier of the port. (21) In addition to projecting and directing these defensive constructions Ferramolino also rose the fort of Gonzaga in 1540, the Castilian medieval fortress, and he added another old castle to the modern wall, the Matagrifón. These intense and costly works forced the implementation of a tax on wine and seek the cooperation of the population in some occasions, like when 4000 neighbors came to dig the moats of the city in 1552 when the Turkish squad was passing through the strait near the city, without attacking. (22) El Salvador's castle was built after 1540, when new shipyards were added in front of its land front in 1565 by the Viceroy Garcia de Toledo. In the seventies of the 16th century, the engineer Julio Cesar Brancario worked on these military works and designed a new bastioned front in front of the arsenal, protecting the shipyards along with the fort of el Salvador.

In 1582 the abandonment of these fortifications was reported to Philip II, despite the reinforcement works of the Count of Alba. (23) The needed improvement and modernization of these did not arrive until the viceroyalty of the Count of San Esteban in the 17th century, when the engineer Charles of Grunembergh projected a pentagonal citadel of the port in 1685, an exemplary work of military architecture. (24) His membership in the Bourbon kingdom transformed the last redoubt of these troops in 1861 during the "*Risorgimento*", becoming a symbol of monarchical oppression. After World War II it was abandoned and in ruins. The port's expansions forced the demolition of half of its structure, where only remain standing two bastions and the defensive elements that precede them.

2.3.- VALLETTA THE VANGUARD OF THE WEST

After the abandonment of the city of Rhodes, the knights of the Military Order of St. John settled on the island of Malta in 1530, an strategic position and yet at the same time a dangerous set in the Mediterranean, where they developed the border gendarmes mission against the Turkish threat. Until the construction of Valletta in 1566 they were not certain that the island was their final and permanent destination. First they built the Sant'Elmo's bastioned fort in 1565, key to the defense of the stronghold during the first siege of the Turks to the new tenants of the island. The construction of the stronghold of the military order of St. John is due to the decision of the Grand Master Jean Parisot La Valette, following the planning of the Italian engineer Bartolomeo Genga, 1558. However, the length of the stronghold was decreased in a new project in 1562 by Baldassare Lanci. (25) The Turkish attack provoked European support to rebuild the town after the siege, this time with a project of the engineer Laparilli in 1566, author of the bastioned fortification of Valletta until his departure in 1569, being continued by Ludovico Cesano in 1575, who completed the construction of Sant'Elmo's fort (26).

In the decade of the seventies, with the fortifications under construction, the relationships of the technicians and specialized construction personnel remained close with Sicily. Syracuse became, in those years, the closest rearguard to the island of Malta, therefore acquiring an important strategic value, since the fall of Syracuse on the Sicilian coast would represent the

almost certain conquest of Malta. New defensive elements and the improvement of the already existing ones continued at the end of the century by the engineers from the Spanish army Scipio Campi and later Tommaso Dingli, author of the Royal Gate built in 1632. Campi worked in both, Valletta and Syracuse in 1576, issuing reports and projecting the fortifications (27).

In the 17th century the bastioned lines of fortification continued to increase the defensive potential, under the design of Pietro Paolo Floriani from 1638, always with the fear of a Turkish naval attack. Charles of Grunembergh, author of the citadel of Messina, strengthened the bastions of the Sant'Elmo's fort in 1681. (28) The size and cost of its maintenance were felt in the 18th century with the appearance of serious deterioration in such an extensive military complex. Far from what one would expect it was not the Turks who besieged Valletta but a French squad, when in 1798 Napoleon conquered the island ending the military history of the Order of St John in Malta. Later the stronghold became a British possession until the mid 19th century, increasing the number of coastal forts to derive the defense to specific locations and also rebuilding the Royal Gate. In 1888, British reports speak of Valletta as a square with fortifications and military equipment already obsolete. (29)

During World War I, Malta and Valletta became vital points of the British logistics, having become the great military hospital in the Mediterranean. Until World War II, Malta had not suffered such a devastating attack since the 16th century. On the 11th June 1940, Benito Mussolini declared war on Great Britain, bombarding the island of Malta as the closest British colony to Italy. Meanwhile the terrified population fled to the ancient fortifications to find shelter. In 1941 the Germans attacked the port of Valletta where part of the English fleet was, causing a massive destruction in the city and needing an enormous restoration afterwards.

3.- THE FORTIFICATION OF NORTH AFRICA

In the late 15th century, the Spanish monarchy, heir to the kingdom of Aragon, began the conquest of the kingdom of Naples in Italy, and a series of naval expeditions to take the most dangerous North African strongholds for the safety of the Spanish coast, such as Tunis, Algiers, Tripoli and Oran. The centre of naval operations was set in Sicily during the reign of Ferdinand II of Aragon in 1501. Having conquered Naples, the Spanish troops were shipped to Africa. Mazalquivir (MersElKeb) was the first conquered stronghold in September 1505, while Oran fell on the 19th of May 1509, under the command of Cardinal Cisneros and Pedro Navarro a general expert in engineering (30).

The expansive policy of King Ferdinand in North Africa was held back with some defeats, until his army conquered the Bújia's stronghold, which was accompanied by the fall of Algiers, Tunis and Tlemcen, which became Spain's tributary freeing the Christian captives. Finally Pedro Navarro departed from Trapani (Sicily) in 1510 with a squadron to Tripoli, which was conquered after a grueling battle with more than 5,000 casualties in Africa. (31) The Spanish naval actions consisted of the conquest of small independent kingdoms of Africa, without the Mediterranean appearing yet as a united force that would

group the Muslim cities, until 1513 when Sultan Selim seized power in Turkey and his squadrons became the greatest enemy of the Christian kingdoms of the western Mediterranean. From then on, then Spanish need of fortification of the coast and squares became essential. At the entrance to the port of Tunis, the engineer Pedro Navarro rose, in 1510, a turret of a square floor-pan for artillery, which later became the castle of La Goulette .

3.1.- SPANISH CONSTRUCTION IN NORTH AFRICAN CITIES

After failing Homich (Barbarossa) in the storming of the Bújia, where he lost his left hand and his brother Isaac, his fleet was able to conquer Tunis from its monarch Tumin, personally assuming the royal crown of the stronghold in 1517. Spain, under the government of Cardinal Cisneros, sent a squadron to retrieve this allied city though the expedition was a disaster, as the Spanish troops revolted against their leaders and lost 3000 men. Barbarossa, who had 400 slaves, took the opportunity to immediately conquer the strongholds of Tunis and Tlemcen. The answer of Charles V, who still held the stronghold of Oran, was the retrieval of Tlemcen with an army that chased and executed Homich (32).

The city of Algiers was subjected to the forces of Ferdinand king of Spain in 1510, the engineer Pedro Navarro reinforcing an artillery turret on the rock of the port to bombard the city in case of rebellion, which had a Spanish garrison. From 1516 Algiers was recuperated by the Turks, being governed by Aradino (Yeir ed Din), Homich's brother, which could not conquer it with a Spanish expedition, sent from Sicily in command of the Viceroy Hugo de Moncada.

Relations between Turkish forces and the local kings in the cities of North Africa were not always cordial, where the breakdowns of the relationships between Africans and the defensive alliances with the Spanish themselves against Barbarossa were constant. This allowed for a small Spanish garrison to be kept isolated in the turret of the port of Algiers for years. (33) In the UNESCO's edition of the "*General History of Africa*" the situation of coexistence between the Maghrebian authorities and the Spanish occupation forces is described: "*This policy of occupation must be completed with the constant search of allies or protected locals. The most famous were the sultans Hafsids, practitioners of the subtle game of alternating between Spanish and Muslims since 1535: the last sultan, Muhammad (1573 - 1574), agreed to divide his power in Tunis with the Christian commander of the capital. Just like the Hafsids, the last Zayyanide of Tlemcen, granted an intermittent alliance with the Spanish, until the capture of their capital by the Turks and their final disappearance in 1551- 1554. The Iberians also disdained the alliance of the heads of lesser importance, such as Shabbiya of Kariuán and from central Tunisia, around 1550, or the Banu Amir and Banu Rashid in the region of Oran. But, in general, the religious and cultural barrier was such that any lasting approach between the Spanish and the local chiefs was possible. That was exactly what the Turkish Muslims took advantage of*" (Bethwell Allan Ogot. Volume V, pg. 284, Berkley 1992)

The city was surrounded by the old medieval turreted wall, with six bastions at the corners of its rectangular floor-plan. The dock only had the turret on the pier of the island Julia Cesarina, while on the hills that surrounded Algiers were three modern castles of 16th century, the Imperial castle with a turret and three bastions, the new castle and another fortification risen in 1569. In the first decades of the 17th century, the Spanish concern about Turkish naval attacks on coastal cities of Italy or Spain continued. One of the foremost military engineers of the reign of Philip III, the Italian Pietro Paolo Floriani played an important role by strengthening the walls and bastions of Valletta. He was commissioned by the Spanish monarch to do a work of espionage which consisted of designing the plans of the city of Algiers and its defenses, between 1620 and 1630, studying a plan for the conquest of the stronghold plane which is preserved, like so many others in the General Archive of Simancas (Spain).

Aradino became the greatest danger to the Spanish and Italian coasts in the twenties and thirties of the 16th century. The Turkish fleet that he commanded conquered Tunis, which later recovered by the Spanish in 1535. In reprisal, the general of the Ottoman army attacked the Balearic Islands in Spain, plaguing the coastal town of Mahon where he took 800 prisoners. Sultan Suleiman, with his admirals Luftibey and Aradino, forced a frantic period of military construction on the Mediterranean coasts, adapted since then to the new techniques of bastions from 1535, with the intervention of the first modern engineer of the Spanish army, the Italian Antonio Ferramolino (34).

The African work of Ferramolino was the reconstruction of the fort La Goulette, in the entrance canal to the dock at the port of Tunis. (35) The bastioned layout of La Goulette was risen between 1535 and 1545, being irregular in shape with an arrow's shape and triangular floor-plan. Ferramolino's proposals were analyzed in Madrid and they opted for making a rectangular castle with four bastions at the corners, forming a true defensive axis between Sicily, Malta and La Goulette which blocked the Turkish Armies with immediate priority in fortification work, started in Sicily by Ferramolino surrounding Palermo and Messina with bastions. The life of the engineer, in the service of the Spanish army, finished in Africa in 1550 when he was shoot by a harquebus whilst exiting a mine's gallery.

La Goulette and Tunis were recovered by the army of Sultan Suleiman, after the breakup of a brief truce with the Emperor Charles. The Spanish troops, commanded by John of Austria, had to await the return of the fleet after the battle of Lepanto in 1571, to reconquer the town and its castle two years later. Definitely Tunis became a member of the Turkish empire after a naval siege and conquest of the stronghold in 1574. On behalf of John of Austria the Spanish engineers had built another fort of hexagonal floor-plan next to La Goulette, defending the entrance to the city of Tunis, against the orders of King Philip II himself, opposed to diversify isolated castles along the African coast of costly maintenance and defense. (36) The fort of the La Goulette, to avoid a possible recovery in Spanish naval attack, was shot down by the Turks and transformed into a simple battery with two bastions, as it remains today.

3.2.- THE DEFENSIVE COMPLEX OF ORAN

The reasons why Oran was one of the most obsessive places of conquest by the Spanish monarchy in the 16th century, lie in its proximity to the coast of the Iberian peninsula with which a direct contact for centuries of Muslim rule in Andalusia was maintained. After the conquest of the kingdom of Granada by Ferdinand and Isabella at the end of the 15th century and the Muslim withdrawal to North Africa, the tranquility of the Hispanic coasts was due to the conquest of the stronghold from which coastal towns of the Hispanic Mediterranean were continually besieged, from Gibraltar to Valencia. The Spanish monarchs were aware of the realities of African cities in the nearby kingdom of Tlemcen and its military power, keeping the idea of continuing the reconquest there. (37) On the death of Queen Elizabeth she left a will that reads as follows; "*I pray and command to the Princess my daughter and the Prince her husband to be very obedient to the commandments of the Holy Mother Church, protectors and defenders of her, as they are bound, and not to stop the conquest of Africa and to fight with faith against the infidels*"(38). These Islamic towns were strongly protected by walls, cubes and medieval citadels, which proved to be ineffective against guns and modern artillery, requiring a long period of defensive transformations and new coastal and port fortifications, which occupied the 16th and 17th centuries.

After the occupation of Melilla, nearly a decade later, the first African Spanish military expedition of the 16th century was organized to conquer a fortified peninsula located four leagues west, next to the city of Oran, Mers el Kebir (Mazalquivir for Christians). Under the leadership of the government of Cardinal Cisneros, in June 1505, the preparation of an army began to stop Africans and Turkish attacks that Spanish and Italian coastal cities were suffering. The fleet in which Cisneros himself went, commanded by the Marquis of Comares, conquered the Arabic castle of Mazalquivir in mid October of that same year. Not until two years later the did the Spanish garrison make a raid on the stronghold of Oran, which was a resounding failure, because of the difficult terrain and the constant harassment of the town, leaving a precarious situation for the Spanish garrison of Mazalquivir during subsequent years (39).

The royal proclamation for the conquest of the region of Oran was in Toledo on the 21st of August 1508, transporting in the ships up to 4000 horses. The arrival of the fleet at the Oran's Bay occurred on the 17th of May 1509, when the troops landed and attacked their walls over land. Situated on a hillside, a medieval fence consisted of a series of towers connected by a high wall, with the citadel on the higher area. Pedro Navarro led the attack, proving the need to fortify the surrounding hills from which he led the conquest, which where several hundred Christian captives were released. Cardinal Cisneros began to build on the ruins of the mosque of Ibn Beitar the church of San Luis in the old quarter of the town. This feat of enormous significance for the Christian kingdoms, was immortalized in the Mozarabic chapel in the Cathedral of Toledo, where the artist Giambologna made the frescoes on the conquest of Oran.

Until 1792 both Oran and Mazalquivir were two Spanish strongholds, transforming and modernizing their fortified structure for three centuries. Mazalquivir was amended, under Philip II, by the Italian engineer Juan Bautista Antonelli, who in 1574 built on the site of the old town a rectangular Renaissance fort (St. Andrew) with four bastions adapted to the narrow peninsular platform. The rest of the rocky peak of the stronghold had an irregular artillery wall (40). The fortress was rebuilt in the 18th century with the expansion of a half moon in the moat and other minor batteries added to the bastions of the Land front. The premises for the garrison were of the same time as is shown in a plan of Manuel Sanchez in 1775. As a French garrison the Mazalquivir's port was shelter for the gala squad during World War II. To prevent their use by the German army, the British fleet bombarded and destroyed it on the 3rd of July 1940 in the Operation "Catapult", damaging the fortification and ruining the lighthouse built by the French at the tip of the enclosure.

The capture of Oran by the Spanish in 1509, meant the massive abandonment of the native population and the destruction of the hamlet (41), to later become a Western city. After the occupation the construction of fortifications in the city and its surroundings began, dominated by various headlands and hills of difficult military control. "La Mona", a fort-jail, arose at a nearby ledge of the bay, forming a flank to defend the west hills of the stronghold formed by La Mona ("fort Lamoune " or "Moune" for the French) and the St. Gregory's Castle and the Santa Cruz. The latter fort was built on the hill "L'Áidou" in 1563 by D. Alvaro de Bazan Marquis of Santa Cruz, to whom we owe its name, reformed years later by Juan Bautista Antonelli, to convert the residence of the governor, with a voluminous interior construction, provided the citadel not being secure. This fortification was again restored by the French army between 1850 and 1860, after the occupation of the city in 1831.

The position of the Oran city between the coast and the valley of Vallecillo, left it open to any attack along its eastern front, which the Spanish were fortifying since the 16th and 17th centuries. The system of castles lined up next to the stronghold on the nearby hills consisted of the San Philip, the San Andrew and the Rosalcazar this last of which, was high above the port. In the 17th century forts of St. Phillip and St. Andrew kept an irregular structure, each with two bastions facing the walled stronghold. They remained like this for a century, until the Marquis de Robledo asked in July 1693 the reform and reconstruction of the defenses against an imminent Turkish threat. The reforms affected St. Phillip and St. Andrew, while projecting the Rosalcazar whose construction was completed in 1701. The St. Phillip had only one front with two bastions open towards the city available, like the St. Andrew, lacking consistent defenses inland, where they could be easily taken. These problems must have contributed to the fall of Oran in 1705, recovered by the Spanish in 1732, a time in which a campaign for restoration and modernization of all its fortifications began.

The sconce of St. Gregory, in line with the one of Santa Cruz, was renovated in 1733 with a project of the engineer Antonio Montaigu, held in Seville. The

reform of the Castle of St. Phillip had started a year before, work that had been previously amended in 1639 and which only had a front of two bastions. Mr. Juan Ballester also projected in 1736 the reform and expansion of the castle of St. Andrew, regularizing its floor-plan and opening a second inland front.

Nowadays, only remains of these fortifications, built in public spaces or covered by the expansion of the modern towns, are conserved. The major reform took place in the Rosalcazar's castle, whose expansion in size is also implemented in 1736. The front was extended along the coastline of the elevation of the Port, and the size of the bastions were expanded towards the land. (42) This was the state in which Oran's defense system was found when the city was besieged in October 1792 by the Ottomans, which coincided with an earthquake that crumbled almost the entire city. The little strategic interest of the city led to a treaty of cession by the Spanish in the same year.

NOTES:

- 1.- Boira Maiques, J. Vicent, "Las torres del litoral valenciano". Page. 18, Valencia 2007.
- 2.- Ibáñez de Íbero, Carlos, "Historia de la Merina de Guerra Española". Page.145, Madrid 1939.
- 3.- Soraluze Blond, J. Ramón, "Historia de la Arquitectura restaurada; del Renacimiento al Movimiento Moderno". Page 336, A Coruña 2010.
- 4 .- The oldest description of these fortifications of Peniscola, is due to the royal commissioner Juan de Acuña, who in 1585 describes in detail both the fortifications and the Arabic castle, as the works of bastions and curtains raised by Antonelli. See: Boiraca Maiques, J. Vincent, "Las torres del litoral valenciano" Page 237, Valencia 2007.
- 5 .- The floor of the front with bastions of Peniscola by Antonelli is preserved in the General Archive of Simancas, MPD 09,059.
- 6.- Soraluze Blond, J. Ramón, "Historia de la Arquitectura restaurada; del Renacimiento al Movimiento Moderno". Page 344, A Coruña 2010
- 7.- Capel, Horacio and others "Los ingenieros militares en España siglo XVIII repertorio bibliográfico e inventario de su labor científica y espacial". Barcelona 1983.
- 8 .- Fortification of Alicante from the Muslim castle on the hill overlooking the town, turned into Santa Barbara Castle, may had been devised by the Viceroy of Valencia Vespasiano Gonzaga, and designed by Bautista Antonelli, who is credited with the plane of the fortification in 1575, preserved in the General Archive of Simancas, MPD, 19, 004. Army and Navy, files, 00 079, 102 Viceroy's letter accompanying the Court the 30th of September 1575.
- 9 .- The defensive system of the area of the Alfaques, meant building several towers, with divided opinions about its effectiveness, location and project. See, Cámara Muñoz, Alicia, "Las torres del litoral en el reinado de Felipe II: una arquitectura para la defensa del territorio" in "Space, Time and Form""Espacio, Tiempo y Forma" No. 4. Pag.75, Madrid 1991.
- 10.- Catalá i Roca, P., "De cara a la mediterrania. Les torres del litoral catalá". Page. 73. Barcelona 1987.
- 11 .- A complete survey of the coastal towers of the Kingdom of Valencia can be found at: Boira Maiques, J. Vincent, "Las torres del litoral valenciano" Valencia 2007 and also in the article by Alicia Cámara cited in footnote 9.
- 12.- SORALUCE BLOND, José Ramón: "Arquitectura militar moderna. Italia campo de experimentación – Las defensas del Mediterráneo", en *Historia de la Arquitectura Restaurada; del Renacimiento al Movimiento Moderno*. Publication Service of the Univeristy of A Coruña, A Coruña, 2010, pp. 306 – 308 y 318 – 321.
- 13.- SORALUCE BLOND, José Ramón: *Las fortificaciones españolas de Sicilia en el Renacimiento*. Publications Service of the University of A Coruña, A Coruña, 1998, p. 7.
- 14 .- The architectural work and theory of the Spanish engineer Pedro Luis Escrivá, was collected in the 19th century by the military of corps of engineers Edward Mariátegui in the book "Apología en excusación y favor de las fábricas del reino de Nápoles por el Comendador Scribá" Madrid, 1878, where he published the manuscript with the same title in the 16th century. Escrivá's work has been studied more recently by Antonio SÁNCHEZ

- GIJÓN, Antonio: " Pedro Luis Scrivá, constructor del castillo perfecto" in *Anal de la Real Academia de Cultura Valenciana* 73, Valencia, 1998.
- 15.- SORALUCE BLOND, José Ramón: "El arquitecto Pedro Luis Escrivá. Un tratadista español en la Italia del Renacimiento", en *Q; Revista del Consejo Superior de los Colegios de Arquitectos de España*, 68, Madrid, 1983, pp. 16 – 30.
- 16.- SORALUCE BLOND, José Ramón: *op. cit.*, 1998, p. 39.
- 17.- A.G.S., *Estado – Sicilia*, leg. 1145, doc.88, y leg. 1146, doc. 59.
- 18.- DUCA, Rosario: *Il Castello a Mare di Palermo*. Palermo, 1980, p. 33.
- 19.- SORALUCE BLOND, José Ramón: *Historia de la Arquitectura Restaurada; del Renacimiento al Movimiento Moderno*. Servicio de Publicaciones de la Universidad de A Coruña, A Coruña, 2010, p. 320.
- 20.- *Ibid.*
- 21.- A.G.S., *Estado – Sicilia*, leg. 1116, docs. 20, 23 y 55.
- 22.- SORALUCE BLOND, José Ramón: *op. cit.*, 1998, p.52.
- 23.- National Library of Madrid: M.S. 1 / 61, p.112.
- 24.- SORALUCE BLOND, José Ramón: *op. cit.*, 1998, p. 58.
- 25.- GUIDONI, E. y MARINO, Ángela: *Historia del Urbanismo. El siglo XVII*. Institute of Studies of the Local Administration, Madrid, 1982, p. 87.
- 26.- The Order of St. John had already been expelled from Rhodes and Tripoli in 1565 when Suleiman began the conquest of the island of Malta. The attacks with a powerful army were stopped by the walls of Valletta and the Sant'Elmo's first castle where Spanish troops resisted, having rebuilt the site, after the arrival of reinforcements from Sicily. View: GARCÍA FIGUERAS, Tomás: *Presencia de España en Berbería central y oriental*. Ed Nacional, Madrid, 1943, p. 187.
- 27.- A.G.S., *Estado – Sicilia*, leg. 1146, doc. 34, y leg. 1145, docs. 59, 88 y 99.
- 28.- SORALUCE BLOND, José Ramón: *op. cit.*, 2010, p. 322.
- 29.- *Ibid.*
- 30.- GARCÍA FIGUERAS, Tomás: *Presencia de España en Berbería central y oriental*. Ed. Nacional, Madrid, 1943, p. 117.
- 31.- *Ibid.* p. 122.
- 32.- SORALUCE BLOND, José Ramón: *op. cit.*, 1998, p.15.
- 33.- According to GARCÍA FIGUERAS, Tomás, *op.cit.*, P. 133, "*Algerians would soon be convinced of the mistake they had made when they called the Turks for help. They began to act as rulers, without thinking much of achieving the purpose for which they were called. So it was understood, a little late, that Selim Eutemio, chej of the Mitiyá Arabs and master of Algiers ... He had called Barbarossa to his aid who had stayed at his own home. Barbarossa, who was to serve his own ambition, assassinated him in August of that same year 1516, making himself be proclaimed Algiers' Sultan by the Turks of his army.*". The successive occupation of the North African strongholds by the Turks, Tlemcen among them, were part of a parallel contention to the confrontation with the Spanish, being defeated and losing several sultans and kings at the hands of Barbarossa and his brothers, cases like Tumin king of Tunis, Asair Car lord of Sargel, Hamida Allabdi king of Tenes, Abu Zeyyen king of Tlemcen or the sheikh Bu of Çaba that snatched Kalaa to the Turks
- 34.- SORALUCE BLOND, José Ramón: *op. cit.*, 1998, p.17.
- 35.- TADINI, Guido: *Ferramolino da Bérgamo. L'ingegnere militare che nel'500 fortificó la Sicilia*. Bérgamo, 1977.
- 36.- GARCÍA FIGUERAS, Tomás: *op. cit.*, p. 200.
- 37.- These arguments justify the authorization given by Pope Alexander VI to King Ferdinand II of Aragon to incorporate to the kingdom of Spain all the western North Africa as an everlasting possession, separating in the Strait of Gibraltar the boundaries with the domains that were ceded to Portugal. The city of Melilla was occupied by the Spanish in 1497, creating a diplomatic problem with Portugal that saw this belonging to the kingdom of Fez, within the domain area of Luso. View: GARCÍA FIGUERAS, Tomás, *op. cit.*, p. 103.
- 38.- GARCÍA FIGUERAS, Tomás: *op. cit.*, p. 104.
- 39.- After the setbacks suffered by the occupation forces from Mazalquivir, there was no choice but to continue the launched campaign and attack with a powerful squad in the city of Oran. The King Ferdinand and Cisneros counted at this time with reports on the internal situation of the place which was given to them by the Venetian trader Jerome Vianelli. FIGUERAS GARCÍA, Tomás, *op. cit.*, p. 115.
- 40.- Apart from Juan Bautista Antonelli, in the work of the Mazalquivir's fortress his nephew Cristóbal Garavelli Antonelli also collaborated.

41 .- Oran was razed with more than 6,000 fires, including the mosque, killing several thousand people on the 8th of October 1792.

42.- A.G.S. The documentation related to these works can be found in: Para la Santa Cruz en *Guerra y Marina* leg.02342, para St. Phillip en *Secretaría de Guerra* legs. 03074 y 03707 y para el castillo de St. Andrew en *Secretaría de Guerra* legs. 03706 y 03707.

42 .- A.G.S. The documentation for these works can be found at: for Santa Cruz in *Guerra y Marina* leg.02342, for St. Phillip in *Secretaría de Guerra* legs. 03074 and 03707 and for castle of St. Andrew in *Secretaría de Guerra* legs. 03706 and 03707.

Picture captions:

- 1 .- Spanish Mediterranean coastal cities. Mapping from 1605.
- 2 .- View of Barcelona by Wyngaerde in 1563.
- 3 .- Fortification of Peniscola in 1578, by G. Battista Antonelli.
- 4 .- San Felipe of Mahon's castle on the island of Minorca. German engraving from 1756.
- 5 .- Gate of the fortification of Ibiza (Balearic Islands), work from 1585. Photo by J. R. Soraluce.
- 6 .- Santa Barbara's Castle in Alicante. Picture from 1920.
- 7 .- "Barbary" by Ortelius Galle. Atlas *Orbis Terrarum* from 1602.
- 8 San'Elmo's castle in Naples in 1630. General Archive of Simancas (AGS).
- 9 .- Project plan to reform the bastions of Palermo by Alexander Giorgi in 1575. AGS.
- 10 .- Recent restoration of the remains of "Castello a Mare" of Palermo. Photo by J.R. Soraluce.
- 11 .- Plan of the port and citadel of Messina in 1686 by Charles of Grunembergh. AGS.
- 12 .- Valletta (Malta) in 1599. Bertelli's engraving.
- 13 .- Engineer Ludovico Cesano's plan to complete the works of Valletta in 1575. AGS.
- 14 .- View of Algiers in 1574 with the turret of the port. Atlas by Braun and Hogenberg,
- 15 .- First project for the fort of La Goulette in Tunis by Ferramolino in 1539. AGS.
- 16 .- La Goulette being attacked by the Turkish army in 1574. Atlas by Braun and Hogenberg.
- 17 .- The fort of La Goulette as it was in the 18th century. Atlas by J. N. Bellin
- 18 .- Map of the fort of Mazalquivir by Juan Bautista Antonelli in 1574. AGS.
- 19 .- Fort of Mazalquivir - Oran before the Second World War. Postcard.
- 20 .- General system of fortifications in Oran in the late 18th century..
- 21 .- Juan Ballester's plan to regulate in 1736 the St Andrew's castle in Oran. AGS



Fig.1

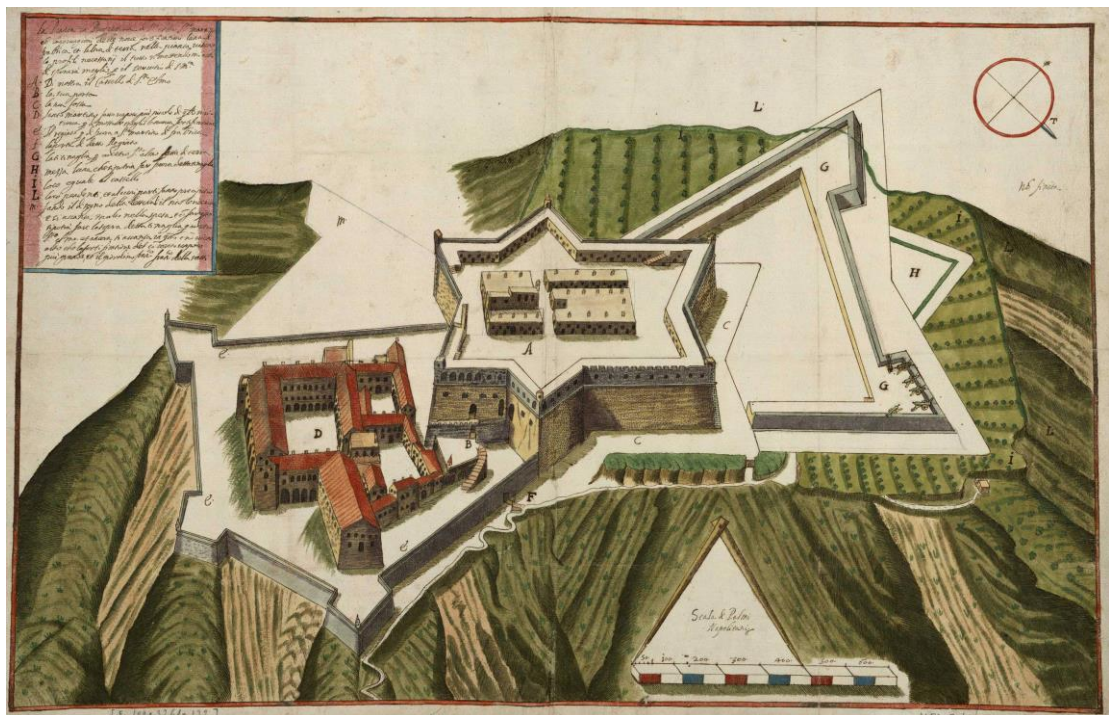


Fig.2



Fig. 3 - 4



Fig. 5

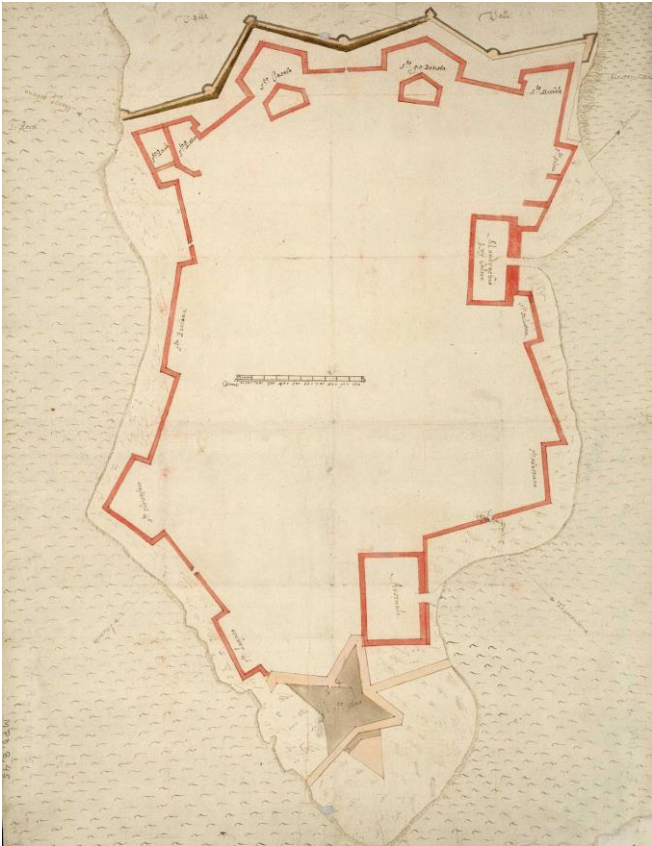
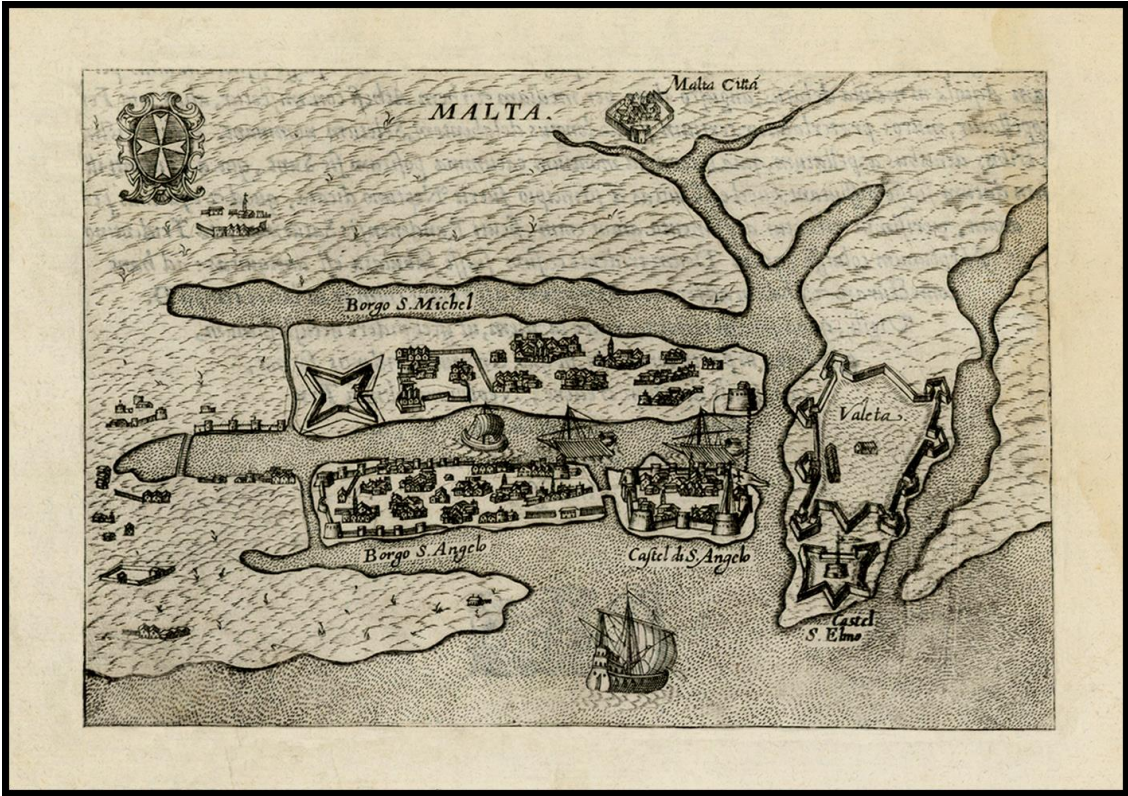


Fig. 6 – 7 - 8

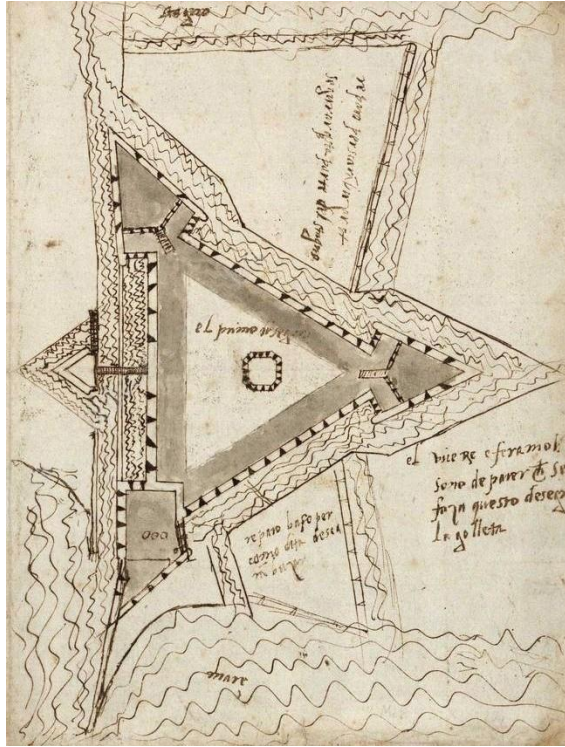


Fig. 9 – 10 - 11

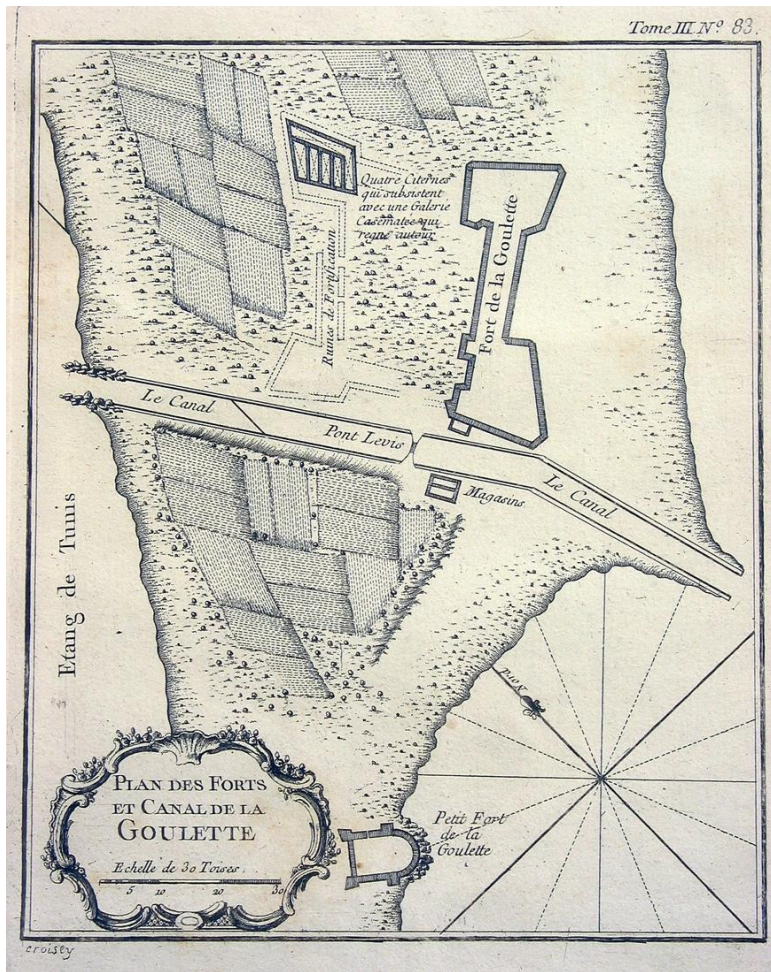




Fig. 12 – 13 – 14 - 15



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